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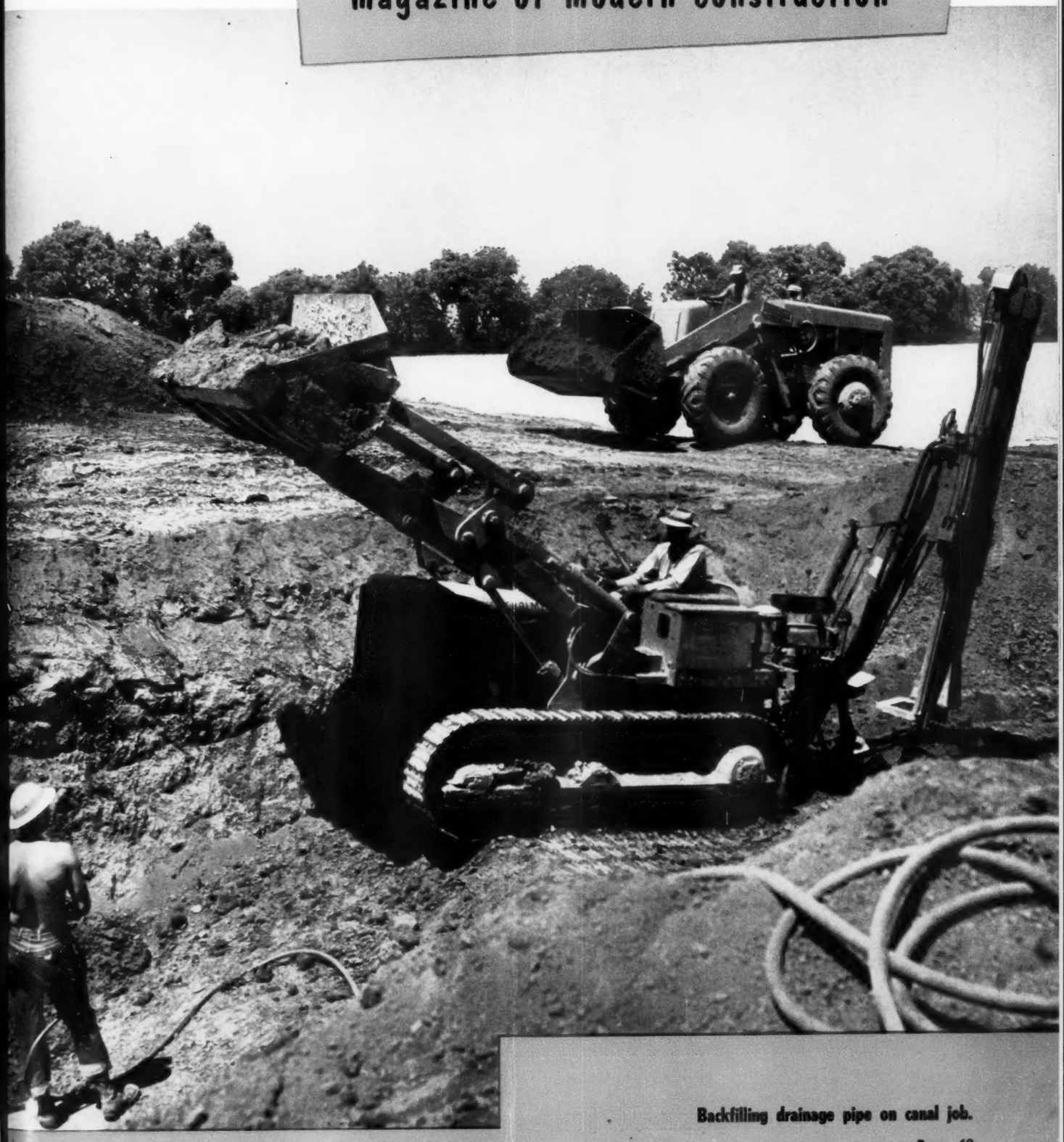
SCIENCES

Contractors and Engineers

magazine of modern construction



Backfilling drainage pipe on canal job.

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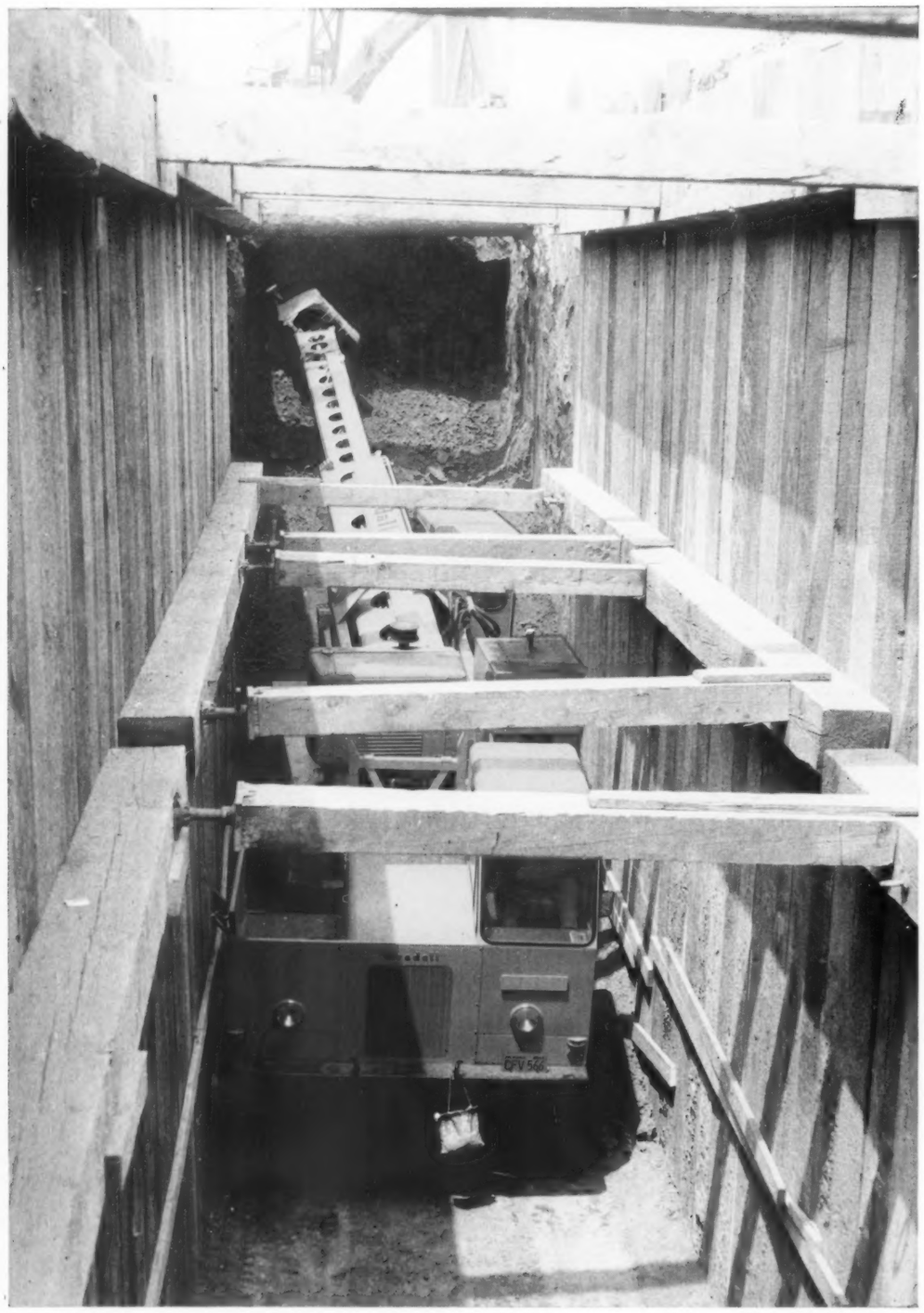
"IMPOSSIBLE JOB? NOT FOR OUR GRADALL!"

says A. Teichert & Son, Inc., Sacramento, Calif.



A. Teichert & Son, Inc., Sacramento, uses Gradall to speed work on the building of a reinforced concrete box storm drain for the Los Angeles Flood Control District.

WORKING on the bottom of this narrow 26-foot deep trench, a single Gradall speedily, safely and economically loosens muck from around existing utility lines—without any damage to these vital pathways.

Less than one-foot clearance on either side of the cut limited the Gradall's swing, but by adding wings to its 3-foot excavating bucket and using 4-foot boom extension, Gradall easily cut the full 12-foot width.

As for savings: Air-powered hand spades previously took 7 days to clean out 560 yards from around *three* utility lines—with their Gradall, 740 yards of muck were removed from around 5 utility lines in less than 4 days, cutting costs and permitting following work to keep on schedule.

Gradall's fast attachment changes, mobility and extreme working accuracy add up to greater contractor profit on every job. For convincing proof, contact the Gradall Distributor in your area and arrange for a demonstration on your own jobs.

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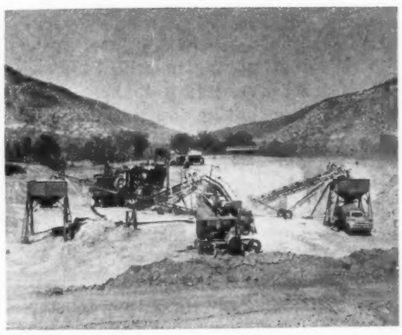

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Editorial

Semantics and specifications

Before the St. Lawrence Seaway is completed, contractors are filing claims for additional payments over and above the amount specified in their dirt-moving contracts. That tough excavation project has already badly bent if not exactly broken more than one contractor.

One of the reasons for this goes back to prehistoric times. Eons ago, great glaciers moved slowly down from the polar ice cap to cover vast sections of North America, including the St. Lawrence valley. When they retreated northward again, they left behind vast deposits of glacial till-unstratified boulder clay mixed with sand and gravel. Naturally the proportions of these materials vary greatly from one deposit to another, as does their hardness or density.

When the U. S. Army Corps of Engineers, the contracting agency, drew up its specifications for contracts on this project, it described the glacial till as "compact to very compact". The contractors, who are filing claims, contend that this was a misleading description, and that a stronger word like "cemented" should have been used to acquaint the bidders with the character of the soil they would be digging. But the engineers counter this criticism by referring to the boring diagrams, available to the contractors, which indicated subsurface conditions and the presence of glacial till.

Even wise old Solomon might find it difficult to say who is right and who is wrong in this case, which has about $7 million riding on the answer. This is the total sum being mentioned for upward adjustment by six contractors.

If the contracting officer denies the claim, the companies involved may appeal to the Army Claims and Appeals Board, and beyond that, if they are so minded, to the Federal Court of Claims or to the Supreme Court.

These court claims are costly to a contractor, even if he wins. The agency involved is also put to much expense, and loss of valuable time by its personnel. Only the lawyers stand to profit well. The importance of reading specifications carefully and thoroughly cannot be over-emphasized. Contractors' engineers and estimators must not take too much for granted. New terrain and unfamiliar site locations particularly call for detailed study and research into local geology. Borings must be interpreted by experts, not dismissed with a casual scanning. Only then can a contractor decide what he is up against. Only then can he plan how to move this material, the equipment he needs to do the job, the labor involved, the time it will take, and what it will cost.

If such a realistic appraisal convinces him, for instance, that he cannot do the job with the equipment he has on hand, then he must figure on getting machines that will be adequate. But he must consider that factor in making his bid. Unless a contractor can bid to make a profit, it is better that he does not bid at all.

Contracting agencies, too, can help avoid costly claims by having their engineers put themselves in the place of the contractor. Have they, too, done enough delving and exploring into local geologic history so as not to overlook any salient facts that might affect a bid? Have they mustered together every available bit of information on subsoil conditions? And have they presented it frankly in readily understood language, and not cloaked in some esoteric terms that might befuddle a contractor? Have they taken advantage of the many new advances in subsoil exploration and testing so that nothing has been left to chance?

If these measures are taken by both contractor and agency, the possibility of claims and counter claims should be reduced. Changing job conditions always will present problems. They cannot be altogether avoided, and are usually worked out by compromise to the mutual satisfaction of both parties. But the bigger problems, caused by misinterpretation or misunderstandings of plans and specifications at the very beginning of a job, can and should be eliminated.

An Allis-Chalmers HD-6 tractor uses its Tracto-Shovel attachment to backfill around a drainage pipe being constructed under the Putah South Canal near Vacaville, Calif. The Ottawa compactor on the rear of the tractor is interchangeable with a backhoe for small excavation jobs. On the far side of the ditch, a Hough Payloader is bringing material to the trench. *Page 48*

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Steel H-beams form guide as sheet piling is driven for storm sewer trench

Two 14-inch H-beams, 60 feet long, serve as a guide as steel sheet piling is driven for a storm sewer project in Chicago. One end of each beam is bolted to the inside of the sheeting on each side of the trench; the other end of each beam (not shown) rests on a third H-beam laid across the trench.

An unusual technique for guiding steel sheet piling during extremely hard driving proved successful on a multimillion-dollar storm sewer project on Chicago's Southwest side.

Thatcher Engineering Corp., Waukegan, Ill., piling subcontractor to Anthony Ponterelli & Sons, Franklin Park, Ill., used an arrangement of three 14-inch steel H-beams—two of them 60 feet long—in driving 56 linear feet of sheeting at a time.

The two long beams acted as guides. On each side of the trench, one beam end was bolted to the inside of sheeting already in place. The other ends of the long beams rested on a third, shorter beam laid across the 18-foot-wide trench. The beams were tied together with chain binders.

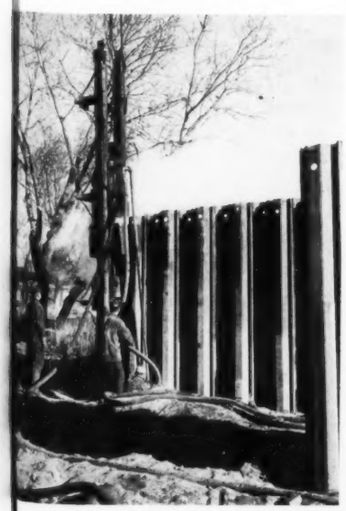
Sheeting rented from L. B. Foster Co. was placed alongside each beam so that it was between the beam and the side of the trench. It remained in perfect alignment with the sheeting in place. A McKiernan-Terry 9-B-3 hammer drove the sheeting five or six feet, enough to keep the wall from toppling. Then the beams were removed and the sheeting was driven to its final depth of about 24 feet.

When the beams were removed, the McKiernan-Terry 9-B-3 hammer was replaced with a Vulcan 50C hammer for secondary driving.

Close behind the Thatcher sheet-driving crew, Ponterelli's men excavated the ditch to a depth of 28 feet. This was 2 or 3 feet below the bottom of the sheeting, but at this depth the clay was densely packed and sheeting was not required.

Two sizes of concrete sewer line were used—15×12 feet and 13×10.4 feet. As soon as the pipe was laid down, the ditch was backfilled and a second Thatcher crew pulled the L. B. Foster sheeting and loaded it into trucks that carried it ahead to be reused.

THE END



A Vulcan 50C pile hammer handles secondary driving to get the L. B. Foster steel sheet piling through a 4-foot layer of clay.

Pressure distributor applies hot Texaco Asphalt to 3-inch compacted layer of broken stone, forming upper course of foundation.

Asphalt's important role on new Connecticut Turnpike

Hot-mix Texaco Asphaltic Concrete wearing surface was laid in two courses, with combined thickness of 3½ inches.

These contractors paved a large mileage of the Connecticut Turnpike with Texaco Asphalt:

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The 129-mile Connecticut Turnpike, newest American toll road, links New York State and Rhode Island. Asphalt was called upon to play a varied, as well as a leading, part in the construction of this important expressway.

Asphalt Pavement: 69 miles of the turnpike have a 3½-inch hot-mix Asphaltic Concrete surface on a 3-inch Asphalt Penetration Macadam base. Supporting the asphalt portion of the pavement is a 4-inch course of dry-bound macadam with sand filler, over an 11 to 23 inch gravel subbase.

Asphalt Shoulders: Either hot-mix Asphaltic Concrete or Asphalt Penetration Macadam shoulders were constructed for the full length of the toll road.

Asphalt Curb: This turnpike is another example of the use of asphalt to provide durable, economical curbing.

Selected for many of the nation's modern, heavily traveled turnpikes, asphalt also is the logical pavement for the 41,000-mile Interstate Highway System. It combines rugged durability under heaviest traffic loads, unequalled riding comfort because of its resilient, joint-free surface, with a substantial saving in first cost—plus other important advantages.

Texaco Asphalt, used in paving a large mileage of the Connecticut Turnpike, also offers the road builder a number of intermediate and low-cost types of asphalt construction for roads, streets, airports and parking areas. Helpful information on these types is supplied in two free Texaco booklets. Copies can be obtained with no obligation by writing our nearest office.

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TEXACO ASPHALT

For more facts, use Request Card at page 18 and circle No. 202

Dredging in the channel of Havana Bay and excavation on shore go on simultaneously for the tunnel, which will link the city and Eastern Havana, the vast tract of land now planned as a modern suburb. Flanking the excavation on the eastern (far) shore are the dry dock, right, and the Morro Castle. Work on The Orchid, the multi-level approach and exit system around the statue on the Havana side, is complicated by limited space and job restrictions.

The Havana Tunnel: *fulfillment of a dream*

Driving, sinking, post-tensioning methods used for mile-long tube; excavation, blasting, traffic control pose big job problems

Outlined by floats, a 353-foot-long, post-tensioned tube sinks under the surface of Havana Bay to the prepared trench. In the background is the eastern approach excavation, which was carried through coral to an elevation 33 feet below sea level. The Morro Castle is to the left.

When a tunnel has been only a dream for 50 years, it is obvious that construction difficulties are numerous. Yet today, problems that once seemed insurmountable are being solved, and the "dream tunnel" linking the old city of Havana, Cuba, and Eastern Havana across the bay is a virtual reality.

When the tunnel is opened, in a few months' time, it will provide fast and easy access from the old Spanish colonial city with its narrow streets to the still undeveloped land on the opposite shore. This area, rising from sea level to an elevation of about 196 feet, is destined to become a new city, "La Habana del Este", a modern, planned suburb with wide streets and avenues and a countrylike atmosphere.

A Bucyrus-Erie crane buckets concrete to crews working on the approach ramp on the eastern side of the bay. The 656×82-foot excavation for the approach is made in a coral formation.

A short distance up the bay from the tunnel approach is the dry dock where the tunnel sections are cast and post-tensioned. The huge Weitz electric tower cranes, riding rails on either side of the dry dock, handle materials and concrete for crews. Reinforcing for tubes is being assembled on either side.

Several tunnel methods

A combination of several methods is being used to build the four-lane tunnel, which is a little more than a mile in length. On the old city, or west, side of the bay, a 328-foot-long section was built in place. Five 16,000-ton prestressed-concrete tubes, each about 353 feet long, 72 feet wide, and 23 feet high, were floated into place and sunk to form the center portion of the tunnel. Another section on the east side of the bay is constructed the same as the section on the old Havana side. On the east side also, the open-cut method was used to build an exit about 1,635 feet long that connects with a 10-lane toll-collection plaza. This plaza is linked to a superhighway that has six rapid and eight slow lanes leading across Eastern Havana.

Special problems

Such a plaza would have been a practical impossibility at the portal in Havana proper. In the limited space available on this side, the designing, architectural, and construction engineering firm, Societe des Grands Travaux de Marseille, had to find a way of funneling traffic away from the portal. This work is under the supervisory control of Frederick Snare Corporation which has headquarters in New York. The contract stipulated that the view from the Presidential Palace to the bay could not be obstructed, that luxurious private residences surrounding the park near the portal could not be damaged, and that national monuments must be respected.

The solution to this problem was The Orchid, a cloverleaf-like, multi-level roadway system which provides three different routes into the city from the portal and three different approaches to the portal. The flow of traffic will be unhampered by traffic signals.

Solutions to blasting and dredging problems had to be found, too, for on the east side of the bay, a natural barrier of massive rocks protects the entrance to the harbor, and the deep channel for ocean-going vessels had to be maintained.

Excavation

One of the initial problems was presented when geological studies and borings indicated the presence of coral formations of variable consistency, but of high permeability, on both shores of the bay. Because of this, the contractor had to discard the idea of using sheet-pile cofferdams for the construction of the tunnel approaches and also for the dry dock on the east shore, where the prestressed-concrete tubes were to be built.

But working with experts and technicians from the French firm, Soletanche, the contractor grouted the coral formations to form excavations for both the dry dock and approaches.

Excavations for approaches on both sides of the bay measured about 656 feet in length and 82 feet in width, and reached a depth of about 33 feet

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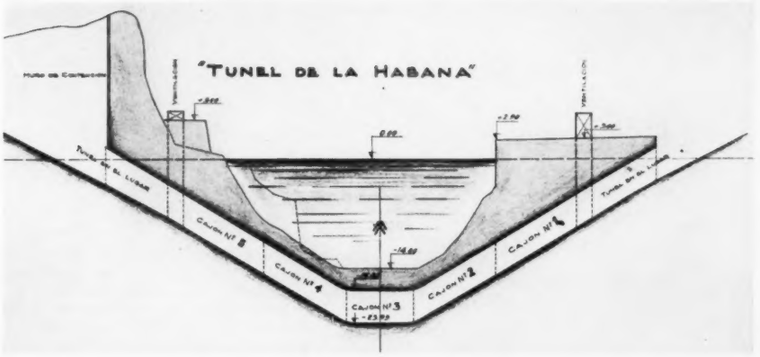
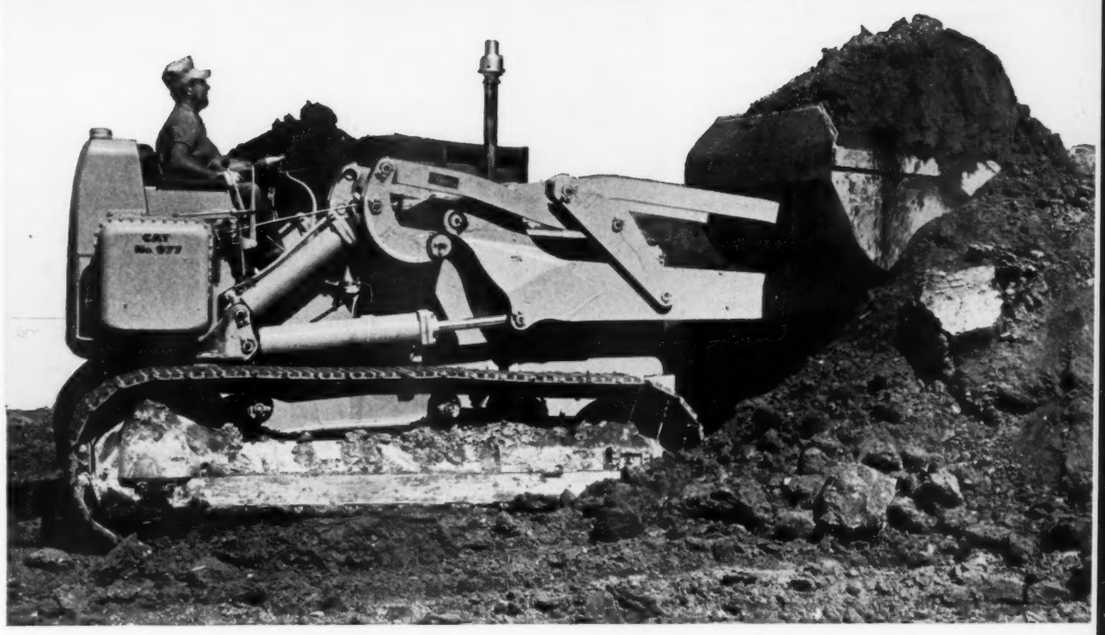


A cutaway sketch of the tunnel, which will have a maximum slope of 5.75 per cent. The horizontal portion is 328 feet long.

"WILL OUTPERFORM ANY MACHINE IN ITS CLASS!"



This Cat-built Traxcavator is loading out soil from spoil heap for grade fill and shoulders — loads out 10-yd. trucks, servicing 5 trucks with a 2-mile haul. Handling damp hard-pan, the husky No. 977 operates in 2nd and 3rd speeds and loads 10 yd. in 2½ min., averaging up to 2,000 yd. per 10-hr. day. The Minnesota State Highway job is 5.4 miles long and it calls for an excavation of 840,000 yd. of all classifications.

That's the way Mr. Markham of the E. Markham Construction Co., St. Paul, Minnesota, feels about his Cat No. 977 Traxcavator, shown loading out soil for grade fill and shoulders on a state highway improvement job in St. Paul.

Owner Markham feels that CAT-built equipment is the "most reliable and best mechanically." He says, "Caterpillar Tractor Co. has wisely shown an understanding of the contractors' equipment needs —no fancy do-dads that look good on paper and flop in operation—just down-to-earth improvements that really work."

Dependable, versatile performance is typical of Caterpillar's line of Traxcavators, from the rugged No. 977 to its tough, agile smaller brother, the No. 933. These finely balanced work units are engineered for the *hard* work, with welded steel frames, lift arms and cross braces of strong, box-section construction, and tilt arms of solid steel. They're easy to handle with quick-acting hydraulic controls.

The 50 HP No. 933, as well as the larger No. 955 and No. 977, are available in the new Series E, with extra-sturdy undercarriage for applications which put the greatest stress on your equipment. And the new side dump bucket can be had for the No. 955 and No. 933 Traxcavators. For complete details, see your Caterpillar Dealer. He'll be glad to talk your kind of language in a deal for the best in earthmoving equipment. And he'll back you up on expert service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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A NEW DIMENSION IN LOADER VERSATILITY

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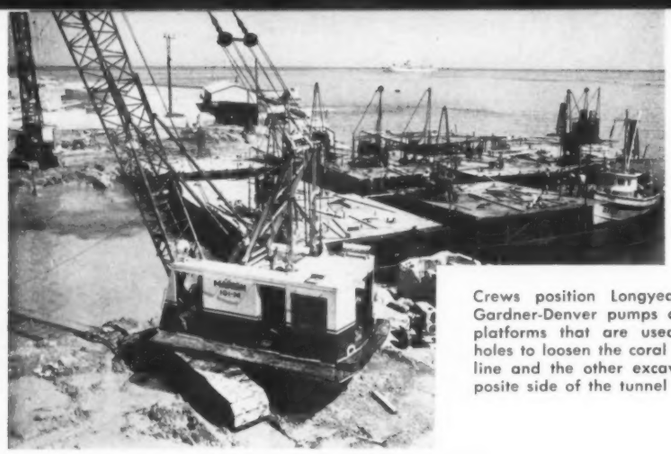

Crews position Longyear boring machines and Gardner-Denver pumps on 33×33-foot adjustable platforms that are used in putting down blast holes to loosen the coral rock for the Marion dragline and the other excavator working on the opposite side of the tunnel cut.

below water level. The excavation for the dry dock measured 492×213 feet and reached a depth of about 30 feet below water level.

The more than 524,000 cubic yards of rock excavated for the approaches and dry dock was stockpiled for use later in the embankment on the Havana side and for filling tubes Nos. 1 and 2. Du Pont Gelex 60 per cent dynamite was used, and MS electric blasting caps, with delays of from 0 to 250 microseconds, secured excellent breakage and reduced vibration effects. This was particularly important, since almost 65,800 cubic yards of material had to be excavated near private buildings bordering The Orchid's zone. The precautions paid off, too, for there were no reports of damage, even to the oldest buildings in the area.

Three Bucyrus-Erie 51-B and two Marion 101-M shovels loaded the rock out to six LeTourneau-Westinghouse Tournarockers and five Mack 15-yard trucks. The stockpiling operation was carefully planned, particularly in The Orchid's zone, where available space was at a premium.

Twelve Longyear boring machines were used to sink the more than 183,725 linear feet of hole in the coral so that more than 30,000 tons of grout could be injected into the formations. This particular job was completed in less than six months. Throughout the work, six Gardner-Denver pumps, four of them double-acting units, kept the area free of water. Pumps operated at a rate of 294 cfm in the dry-dock and east-side-approach excavations; on the old Havana side, where the ground was broken and permeable, pumping was done at a rate of about 1,760 cfm.

Dredging goes deep

The rock on both sides of the bay presented problems when it came to dredging some 327,000 cubic yards of the material to form the bedding for the tubes. Dredging started at an elevation of minus 10 feet on one side and minus 39 feet on the other, and went to 39 and 78 feet, respectively. This meant that dredging had to be carried to depths of from 29 to 39 feet for the tunnel sections.

Square metal platforms, measuring about 33×33 feet, and supported by four legs that could be adjusted to a height of about 46 feet, were set side by side for trench excavation. The same boring machines used in the grouting operations for the tunnel and dry-dock excavations were used to put down blast holes. The 3-inch-diameter holes, which went to a depth of about 6½ feet, were put down in a checkerboard pattern. Plastic tubes were inserted into the holes to preserve their shape and make it easy for them to be located later.

Once a 33-foot-long section of trench was drilled, the platforms were moved to a new position to drill another 33-foot section.

As soon as the platforms were moved, holes were blasted. Nitramon S, with primers and MS delay electric blasting caps from 0 to 200 microsec-

At Western National School, they learn

the A, B, C's of equipment operation

Lubricants Used in Western School's Equipment

Application	Lubricant	
Engine lubrication	Texaco Ursa Oil Super Duty Special	Makes engines deliver more power with less fuel over longer periods between overhauls
Chassis, wheel bearings and general grease lubrication	Texaco Marfak	Stays in the bearings; gives long-lasting extra protection against wear and rust
Track rolls	Texaco Track Roll Lubricant	Seals itself in, seals out dirt and moisture.
Hydraulic units	Texaco Regal Oil R&O	Keeps systems free from rust, sludge and foam
Wire rope and open gears	Texaco Crater	Keeps wire rope strong longer, assures smoother operation and longer gear life
Enclosed reduction gears	Texaco Gear Lube HD	Protects against wear under heavy loads, keeps gears running smoothly.

It doesn't take long for students at Weste ake goo National School of Heavy Equipment Oper rapers, c tion, Weiser, Idaho, to realize there's more ndle an grading or bulldozing than moving dirt. Th d keep soon find out that a contractor's earth-movi A Tex equipment is expensive—and requires the be estern N of care.

At Western, the fundamentals of equipme ubricatio maintenance are drilled into every studen e can he Among other things, students learn that goo ogram, lubrication practice usually involves only a fe an 2,00 well-chosen lubricants. In fact, the school itse States, maintains a highly efficient lubrication progra st 42nd by using only six Texaco products for all majo lubrication—and using them exclusively.

Because of this training, Western graduate

onds pound Bre trench walls. dredg The yards centr prese work ing fi The of e techn

onds were used to detonate 6,600 pounds of explosives.

Breakage was excellent, yielding a trench with almost perfectly vertical walls. Blasted rock was removed by dredges and 2 and 3-yard clamshells.

The dredging of about 130,800 cubic yards of sand for the trench at the central part of the channel did not present special problems, even though work had to be done at depths varying from 39 to 82 feet.

Post-tensioning tubes

The contractor made effective use of equipment and post-tensioning techniques during work on the tube sections. Each tube section, measuring about 353 feet long, 72 feet wide, and 23 feet high, has wall thicknesses varying between about 2.5 and 3 feet. Each of the sections is divided longitudinally by a partition wall, with openings of about 4×7 feet spaced 39 feet apart. These will be used by tunnel police in supervising the movement of opposing traffic in the tunnel.

Two French-made Weitz electric tower cranes, with capacities of about 100 tons each, rode the length of the dry dock on special tracks to handle 2 and 3-cubic-yard-capacity concrete buckets and place prestressed assembly parts, stabilizers, access chimneys, towers, plus other units to be used in sinking the tubes. The cranes were able to rotate their booms up to 98 feet, and their loads were positioned by a sliding chariot working inside the booms.

Sea water floods the dry dock as one of the tube sections, ballasted to give it a negative buoyancy, is tested for watertightness. The dry dock, like the approach excavations, was dug out of coral and its sides grouted.

Some 131,232 feet of cable, required for each tube, was stressed to 60 tons for the walls of tri-directionally post-tensioned concrete. Before all the cables were post-tensioned, a preliminary stress was exerted on the cables to account for eventual deformations and to render all their wires perfectly elastic. The longest transverse and longitudinal cables were stressed from both extremities to balance the stress set up in the concrete. A series of special jacks, mounted on a special jumbo, made it possible for a specified number of cables to be post-tensioned simultaneously.

A stress of 70 tons was set up first, and this was progressively reduced to 65 tons. When this stress was reached, cables were blocked. A reserve stress of 10 per cent was maintained on the cables to insure a service tension of 60 tons.

After the heads of the cables had been sealed, concrete injected into the holes, and the tubes ballasted to keep them from floating, the watertightness of a section was tested. Pumps were stopped, permitting water to fill the dry dock. Since the bottom of the dry dock was at a level of about minus 30 feet, and the tube was about 23 feet in height, it was possible to make the test with a hydrostatic charge.

When a test was finished, the tube was unballasted so that its reserve of floatability could be verified and the theoretic floatability established by calculations.

Sinking the tubes

At this point, the dry dock was opened and the outlet cofferdam was removed. The tube was then towed into position above the trench.

A tube was kept in position by two lines of pontoons to which it was attached in suspension with the aid of block-and-tackle arrangements, each capable of supporting 80 tons. As a tube was slowly ballasted, it began sinking. Its descent was carefully controlled so that it came to rest on four

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provisional concrete supporting bases.

These bases had been cast under water in prefabricated forms. The forms themselves had been sunk along the corner posts fixed to the walls of a tube. These bases were carefully adjusted and provided with screws and bearings before the tube was sunk.

Once a tube was in place on the supporting bases, its position was checked and, if necessary, corrected by the use of horizontal jacks held by the tube at one end and by bearings in the supporting blocks at the other end. This provision helped to simplify the work of divers, though it did not ease the job of actually placing the tube.

When the supporting bases were finished and the trench partially backfilled, the joints were finished. These were about 31 inches wide and 5 feet thick. Since the tubes were reinforced at their ends, jointing was done under water in metal forms fixed in the grooves.

Injection devices were provided all along a joint to insure complete watertightness for the tube, but to date these have not been needed. The concrete of the joint itself has been enough to make the tubes watertight.

When work on the joints was finished, the tube was completely backfilled. The minimum thickness of material around the tube comes to about five feet.

The next step called for joints in the interior of a tube to be finished. After the provisional concrete walls at both ends of a tube were broken, steel reinforcement sheets were solidly anchored in the concrete and welded together. These steel rings alone will resist the hydrostatic pressure of the water in case there is a complete rupture in the concrete at the joints.

Plastic tubes, 2 inches in diameter, will be connected to the central drainage system of the tunnel and make it possible for the joints to be inspected and maintained in the future. If water begins to infiltrate the tube, injection devices will be used to strengthen the joint responsible.

Throughout the work on the tunnel, channel traffic in the bay was interrupted only five times, for periods of from 6 to 12 hours, and these periods always occurred on Sundays when maritime traffic is usually slow.

The channel of entry to the port has remained practically unchanged by the job. The channel, nearly 328 feet wide and 45 feet deep, will be maintained since the central part of the tunnel is horizontal for a length of almost 328 feet. The maximum slope of the tunnel is 5.75 per cent.

Services

Ventilation of the tunnel will be provided through two ventilation towers, one on either shore. Twelve Joy fans, six in each tower, will be capable of renewing the air inside the tunnel in about one minute. Fresh air will circulate inside special conduits running the entire length of the tunnel, and will be evenly distributed through openings spaced about 9 feet apart in two lateral galleries.

Carbon monoxide fumes inside the tunnel will be automatically controlled by devices installed near each portal. The alarms of these devices will be reproduced in the control room so that extra fans can be pressed into service to clear the air.

Rain water accumulating in the tunnel approaches will be led by underground gutters to big cisterns near the entrances. Vertical and automatic electric pumps will pump the water into the sea.

Special care has been given to the tunnel's lighting system. Four zones of lighting will be used so that the luminosity of the tunnel is similar to the intensity of daylight. The central portion of the tunnel has a 1,650-foot-long zone of 350 lumens. This is flanked by intermediate zones, 200 feet long, of 700 lumens. These intermediate zones, in turn, are flanked by entrance-exit zones of 1,500 lumens.

Both zones of access will be lighted by street poles equipped with Westinghouse mercury vapor fixtures. High voltage power will be provided by two independent cables of 13,200 volts each, one coming in from the west side, another from the east side. These lead to two substations equipped with two step-up transformers. Each of the transformers has enough capacity to hold the entire charge needed in the tunnel. Two cables, capable of carrying the total charge, will link the two substations.

An emergency lighting system, instantly started and operated with batteries and converter, together with an auxiliary diesel generator group, will insure the functioning of main services, such as lighting, ventilation, and the operation of pumps and electric signals, in case of a power failure.

The inside of the tunnel, which will be finished in white and blue mat ceramic tiles, will have luminous signal telephones installed at fire stations located 150 feet apart. Traffic signals will be located every 250 feet through the tunnel, permitting traffic to be directed safely through the tube even if an accident requires lanes of traffic to be shifted.

Personnel

The Havana Tunnel is being constructed by the Compania de Fomento

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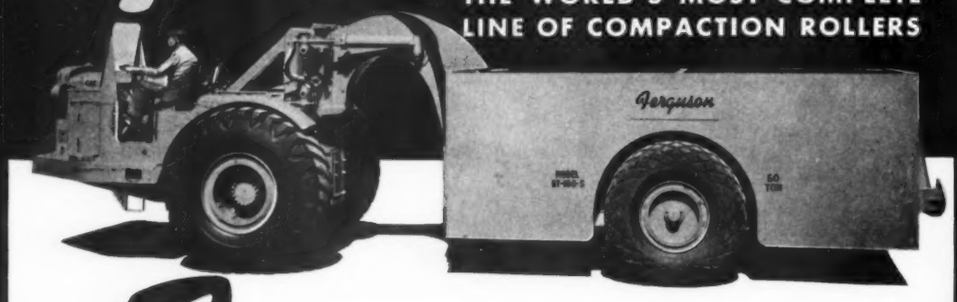
THE WORLD'S MOST COMPLETE LINE OF COMPACTION ROLLERS



THE Ferguson 50 TON RUBBER TIRED ROLLER

For the compaction of large yardages, the FERGUSON 50-ton is standard throughout the world. Tire pressures from 90# to 150# p.s.i. Available with gooseneck tongue for all rubber-tired tractors or straight tongue for crawler tractors. Will compact 15,000 cubic yards per day, depending on soils.

Also available in 60, 100 and 200 ton sizes.

ROLLERS FOR EVERY PURPOSE

We manufacture tandem rollers in 2-3, 3-5, 5-8 and 8-12 ton sizes.

Ferguson and Gebhard tamping rollers are built in all practical types and sizes.

Ferguson self-propelled rubber-tired rollers in 10, 12 and 25 ton models. Gasoline and diesel engines.

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del Tunel de la Habana, S. A., which has Dr. Pedro Grau as president.

All plans for the job were approved by the Comision de Fomento Nacional, which is headed by engineer Amadeo Lopez Castro. Members are Dionisio Suarez, chief engineer; Fidel Pino, commissioner; Armando Perez Cobo, engineer of highways, Luis Saenz, structural engineer, and Antonio Armand, hydraulic engineer.

The work is under the supervisory control of the Frederick Snare Corporation by Manuel Gamba, vice president. Oscar E. Corvison is assistant manager, Miguel Villa is technical advisor, and Manuel Vilaret is engineer in charge of inspection and other engineers.

The Societe des Grands Travaux de Marseille, which prepared the plans and is handling construction, has Raymond Plutarque as general manager for South America; Prof. Jose Menendez as technical director; France Besson, project manager; Jules Fenu, general superintendent; and Louis Poumier, assistant general superintendent.

Cuban engineering specialists are being used on the job, and all workmen, skilled laborers, and foremen are Cubans. The well organized safety department is credited with the low accident rate during the time the job has been under way. THE END

Former BPR Commissioner occupies new ARBA post

C. D. Curtiss, former commissioner of the Bureau of Public Roads, has been appointed to the newly created position of special assistant to the executive vice president of the American Road Builders' Association.

As a special advisor to Maj. Gen. Louis W. Prentiss (USA-ret.), Curtiss will increase the coordination of the association's activities with state and local highway departments, counsel on policies in the field of highway finance, and assist in the advancement of ARBA's research, educational, and technical programs.

Green stone subs for grass on parkway slopes

Those green slopes, under ten bridges in the newest section of the Garden State Parkway connecting with the New York State Thruway at the N. J.-N. Y. line, may look like grass to the passing motorist; actually, they are green-colored stone.

The purpose of this bizarre imitation of nature is twofold, according to the New Jersey Highway Authority: slopes under Parkway bridges built with approach spans and abutments on earth fill are protected against erosion by broken stone, bituminously treated and sprayed with green-colored asphalt emulsion; and the resulting green surface blends with the grass on adjacent slopes for pleasing effect. Not only does this process give the appearance of grass but, Parkway engineers say, the cost is approximately one-half to one-third that of granite block.

Soil mapping discussed in revised HRB bulletin

Highway Research Board Bulletin 22-R, "Agricultural Soil Mapping", brings up to date the status of agricultural soil mapping in the United States, and lists the technical personnel involved in the soil-mapping program in several states.

The $2 bulletin may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Reo names managers

The Reo Division, White Motor Co., Lansing, Mich., has appointed Walter W. Kling manager of the Philadelphia, Pa., district sales office and William T. Giles district sales manager for the Cincinnati, Ohio, district sales office. Kling, associated with Reo for 12 years, has served as salesman, assistant to the branch manager, and most recently as sales manager in the Philadelphia area.

Lloyd J. Tooze has been appointed district sales manager of the firm's Detroit, Mich., office. He will be responsible for sales in the Detroit metropolitan area.

Warner & Swasey news

The Warner & Swasey Co., Cleveland, Ohio, has appointed W. C. Worthington sales supervisor of the Gradall Division. Replacing Worthington as Philadelphia district manager is John Kubik.

Aeroil names Quayle vice president

Alexander Quayle has been appointed vice president in charge of engineering and manufacturing for Aeroil Products Co., Inc., South Hackensack, N. J. He will supervise the production and engineering of equipment for the roofing and paving industries, and oversee the production and engineering of various contracts and special equipment Aeroil manufactures for the armed forces.

Quayle was formerly with the Oilwell Supply Division, U. S. Steel Corp., Dallas, Texas, in various sales and engineering positions. His experience covers 21 years, mostly in product development research and engineering.

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You can do more for less on Tru-Seal Tubeless Rims

It's a fact, proved over and over again, that you can handle tough jobs better—at lower cost—when your tires are mounted on Tru-Seal Tubeless Rims by Goodyear.

Tru-Seal is the only practical way to seal a multiple-piece rim. And like all Goodyear Rims, it offers these money-in-the-pocket advantages:

Unusual Strength: Thanks to an exclusive double-welding process, and added support at points of greatest stress, present-day Goodyear Rims are far stronger than previous rims.

Ease of Tire Mounting: No tube and flap troubles.

Special Tools: Goodyear alone provides both hydraulic and hand tools especially made for off-the-road equipment.

Bond-a-Coat Finish: This protective coating affords long-lasting resistance to rust and corrosion.

If you have a rim problem, talk it over with the G.R.E. (Goodyear Rim Engineer). He'll save you time and money by helping you select the type and size of rim best suited to your needs. Write him at Goodyear, Metal Products Division, Akron 16, Ohio, or contact your local Goodyear Rim Distributor.

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176
Tire on Tru-Seal Rim
TRU-SEAL rubber ring
New Tru-Seal Rims – for sizes 12.00 and up, including all earth-mover and grader sizes. This rim is similar to multiple-piece rims now in use – PLUS airtight Tru-Seal rubber ring which compresses into sealing groove when tire is mounted

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Buy and Specify **GOODYEAR** *More tons are carried on Goodyear Rims than on any other kind*

METAL PRODUCTS DIVISION

For more facts, use Request Card at page 18 and circle No. 206

The use—and usefulness—of output shaft governors for torque-converter engines

The device can be made to improve equipment performance; regulation of about 6 to 10 per cent provides best results

by H. D. NICHOLS, Transmission Division,
Clark Equipment Co., Benton Harbor, Mich.

There is a certain amount of confusion in the construction field about output shaft governors for torque-converter-equipped engines. Many do not like them at all; an equal number praise them too much.

An output shaft governor is, essentially, a speed-limiting device. It serves one basic purpose, to prevent the output shaft from exceeding a predetermined maximum speed. And it is a desirable device, as those who understand its operation and performance realize.

Figure 1 shows the output performance of a typical engine-torque-converter pair under full throttle conditions. The curve shows that with a very light load on the output shaft, the speed of the output shaft increases to about 1,800 rpm. The actual speed reached, of course, depends entirely on the load.

To avoid damage to the machine or related equipment, or the danger of the operator losing control of the unit, the owner may not want the speed to exceed 1,200 rpm. It might seem best, in this case, to have the operator adjust his throttle so that the output shaft speed does not exceed a maximum of 1,200 rpm. But this affects the available output horsepower, as the curve "part throttle output horsepower" shows in figure 1. At an output shaft speed of 800 rpm, only 46 horsepower is available at the output shaft with a part throttle setting. This is 74 horsepower less than is available at a full throttle setting.

This difference results because of the absorption characteristics of a torque converter, as well as the inability of the engine to produce full horsepower at part throttle settings. The lack of horsepower at an output shaft speed of 800 rpm is overcome if the operator gradually opens the throttle, while the load is being applied, until he reaches full throttle. When the load decreases, he can gradually close the throttle to the part throttle setting.

But this procedure is not practical or even feasible. With suddenly varying loads, the operator would be constantly varying the throttle position. The operator has too many other levers to operate manually to be concerned with the throttle lever.

Enter the governor

The output shaft governor can

"10,000,000 cu. yds. of earth compaction is keeping our *Southwest* compaction spread busy at Casitas Dam,"

reports
WINSTON BROS.
Nationwide Contractors

The U.S. Bureau of Reclamation Project at Casitas Dam in Ventura County, California will form a 1,250,000 acre feet reservoir four miles long, two miles wide, and 250 feet deep. The earthfill dam structure itself will be 285 feet high, 2000 feet across, and 1800 feet wide at the base. Part of the $27,500,000 Ventura River Water Reclamation Program, contract for Casitas Dam is $8,576,000, with completion scheduled for 1960.

More than 10,000,000 cubic yards of material will be used in the dam project—most of it from borrow sites above and below the structure. Clay, silt, sand, and gravel will be spread and compacted in five different zones on the job. Lifts are specified variously at 6 to 12 inches, dependent on the zone involved and the materials applied.

To meet U. S. Bureau of Reclamation compaction specifications, Winston Bros. brought to the job a spread of Southwest compaction equipment consisting of a tandem 5'x5' double-drum Sheepsfoot Roller, pulled by a Cat D9 Tractor, a single 5' x 5' Southwest double-drum Sheepsfoot Roller, pulled

by a Cat D8 Tractor, a new Southwest multiple-drum Sheepsfoot Roller, pulled by a Cat D8 Tractor, and two Southwest Sprinkler Tanks—one 5000 gallon and one 6000 gallon capacity—both integrally mounted to Cat DW21 Tractors. This compaction equipment spread will be supplemented as the job progresses so that the contractors will compact as much as 30 to 40 thousand cubic yards of material per day at peak operation.

In Zone #1 on the job — a critical area — earth fill is spread 9 inches deep and compacted to 6 inches. Compaction is achieved with an average of only 12 passes by the Southwest Sheepsfoot Rollers. Bureau of Reclamation engineers report the compaction is topping 96 and has hit as high as 106.

Perhaps one of the most interesting factors on the job, to earthmoving men generally, is the use of the high-speed Southwest 5000 and 6000 gallon Sprinkler Tanks integrally mounted on Cat DW21 Tractors. They operate not only to assist in compaction on the dam structure, but to maintain the heavily traveled, two-way, 2-3 mile haul roads as well. The two big sprinkler tanks meet the requirements of a job which demands a tremendous amount of water to meet compaction specifications,

and a time factor which demands that haul roads stay in top shape. The large capacity of the tanks and the high speed of the rigs themselves enable the operators to apply more water in fewer trips at substantial savings in time, Winston Bros. reports. The wide swath of both the front and rear sprinkler bars (45 feet and 55 feet, respectively) combine the ultimate in efficiency with speed. The Cat DW21 Tractors are perfectly matched with the tanks, making an agile team that moves well under almost any conditions. In-the-seat, finger-tip controls greatly facilitate operation of the sprinklers, and the big rubber tires afford the flotation necessary for working on soft fills.

Winston Bros, personnel also report they are pleased with the new multiple-drum Southwest Sheepsfoot Roller. It is proving more versatile than the standard double-drum type, does a better job of compaction on uneven terrain, and requires less drawbar pull with consequent higher operating speeds, particularly on turns.

COMPACTION IS BEST WHEN YOU USE SOUTHWEST

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CONSTRUCTION MACHINERY DIVISION
Southwest Welding & Manufacturing Co.
ALHAMBRA, CALIFORNIA

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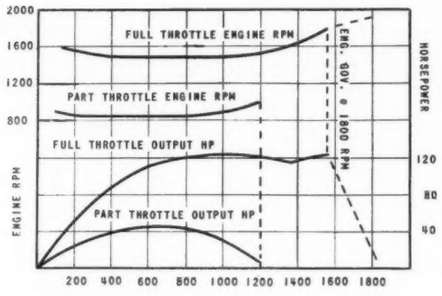


Figure 1: Output shaft rpm

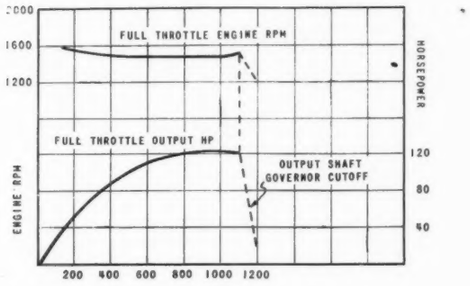


Figure 2: Output shaft rpm

eliminate the need for the operator to manipulate the engine throttle. The governor permits the output shaft to reach a predetermined speed; then fuel fed to the engine is controlled. The way this is done varies from engine to engine.

The entire operation is handled by a flyball governor driven by the output shaft. The governor, in turn, actuates a mechanism which controls the engine's fuel supply. As the engine speed climbs, the governor causes the fuel supply to be reduced until a balance is reached. Then the engine runs at a speed sufficient to maintain the output shaft at its governed speed. The desired output shaft speed is obtained by adjusting the governor; the speed range provided is generally 800 to 1,400 rpm.

The mechanism for driving the flyball governor from the output shaft varies with different makes of torque converters. Usually, it is a spiral gear-and-shaft combination or, as in the case of Clark-Torcon industrial converters, a V-belt drive.

The drive from the output shaft to the governor is generally an overdrive ratio. For industrial-type converters, it is usually a 1 to 2½ step-up ratio. This creates enough flyball energy to actuate the mechanism controlling engine fuel. If the drive ratio were 1 to 1, flyball speed would be too low to provide sufficient energy, unless large flyballs were provided. Where high output shaft speeds are required, the drive ratio must be reduced to approximately 1 to 1.5 to prevent excessive flyball speeds.

Governor performance

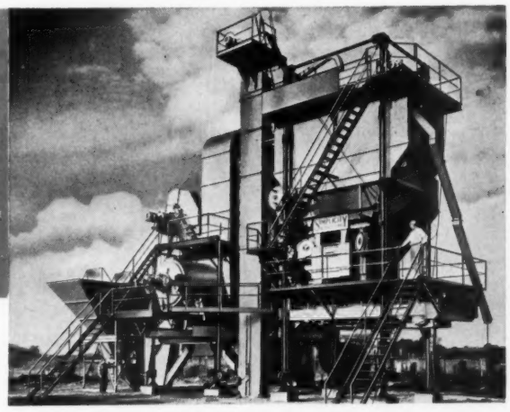
The improved output performance with a governor can be seen in figure 2. With full engine throttle the output shaft can reach a top speed of only 1,200 rpm. As the load increases, the output horsepower available follows the "output shaft governor cutoff" curve until the full output horsepower curve is reached. At this point, the output shaft governor is no longer in effect and the performance at the lower output speeds is the same as that developed at full throttle.

The full output horsepower curve is reached usually about 10 per cent less than the maximum, or no-load, speed of the output shaft. The area from about 1,100 to 1,200 output-shaft rpm is known as the governor

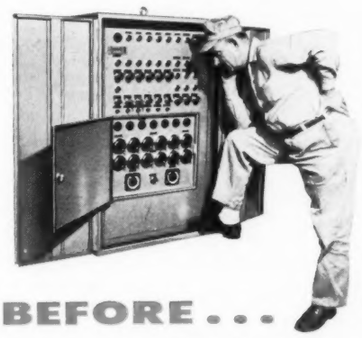
(*Continued on next page*)

SIMPLICITY

ASPHALT PLANTS WITH AUTOMATIC CONTROLS



Thoroughly proved in actual daily operation in many areas and under various conditions on new Simplicity Plants and also as added equipment on older Simplicity Plants.



BEFORE . . .

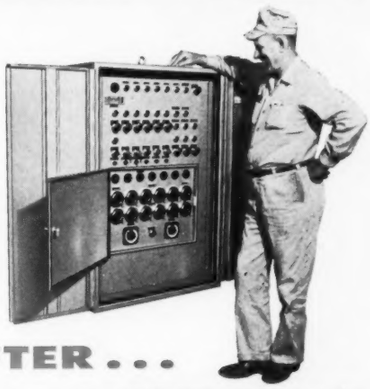
Typical Comments BEFORE they bought and operated the Simplicity AUTOMATIC:

"It's too complicated."

"That thing won't give you anything but trouble."

"Not worth a damn."

"I wouldn't have that thing."



AFTER . . .

Comments from the SAME MEN AFTER producing 100,000 tons or more on a Simplicity AUTOMATIC:

"It will do everything but talk."

"I like everything about it."

"3000% sold on the Automatic."

"I wouldn't have a plant without Automatic controls."

Any piece of equipment that can so completely change the attitude of the men using it must really be good. Let us put you in touch with men who know the benefits of Simplicity Plants with Fully Automatic weighing, batching and mixing.

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(Continued from preceding page)

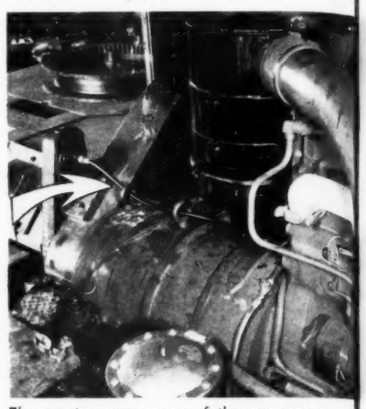
overrun area. The steeper the cutoff line, the more sensitive the governor. This area is also known as governor regulation. In other words, a governor which gives a no-load speed 10 per cent higher than full-load speed is said to have 10 per cent regulation.

Governors with more than 10 per cent regulation tend to give a machine sluggish performance; if the regulation is too small, the governor will tend to hunt and speed control will become erratic. In general, regulation of approximately 6 to 10 per cent will result in good machine performance without hunting.

Figure 2 shows the maximum output shaft speed to be 1,200 rpm. Yet, when a load is encountered, full output horsepower is available. This is accomplished by keeping the engine throttle in the full open position at all times so that the operator will not have to juggle the engine throttle setting during periods of light load. Under a true no-load condition, the engine speed will be about 1,200 rpm. But by the time full output horsepower is available, the engine will have reached a speed of approximately 1,520 rpm. This follows from the operation of the governor. When the output shaft is slowed down by a load, the output shaft governor permits more fuel to enter the engine, and this causes the engine to speed up and develop more horsepower. When the full-load point is reached, the output shaft governor is no longer in effect and the engine-converter performance is that of a full-throttle engine.

Governor application

The most common application of the output shaft governor today is on the excavator crane. The load cycle for this machine varies widely from a very heavy load during the digging portion of the cycle to a very light load during swinging. If the output shaft were permitted to run at 1,800 rpm during the latter operation, the machine would swing so fast that the operator would not have control of the rig. On the other hand, if the speed is governed down to 1,200 rpm, no control problem arises.



The most common use of the governor today is on excavator cranes. A flexible rotating cable (arrow) leads from governor to governor drive. With the governor, the speed of the rig is controlled throughout the heavy-to-light load cycle.

Theoretically, the gear ratio to the swing machinery could be changed so that a suitable swing speed would be reached at an output shaft speed of 1,800 rpm. This would eliminate the need for an output shaft governor. But the increased reduction from the output shaft would result in an excessive line pull. This would cause cable breakage and increase the danger of the machine tipping over.

The use of output shaft governors is gradually increasing, and eventually they will find widespread use in the motor grader, wheel and track-type tractors, and trucks.

In these types of applications the output shaft governor still acts as a speed-limiting device to maintain a nearly constant travel speed. Load variations on this type of equipment will not appreciably affect the output shaft speed and, consequently, the vehicle speed. This happens only when the load becomes great enough to lug the output shaft down into the full-throttle performance portion of the output curve.

For such applications it is usually desirable to be able to vary the desired output shaft's governed speed. This can and is being done merely by providing an output shaft governor which has provisions for variable speed settings. These governors are so built that the desired speed setting can be obtained by a remote control such as a foot pedal or hand lever easily accessible to the operator.

THE END

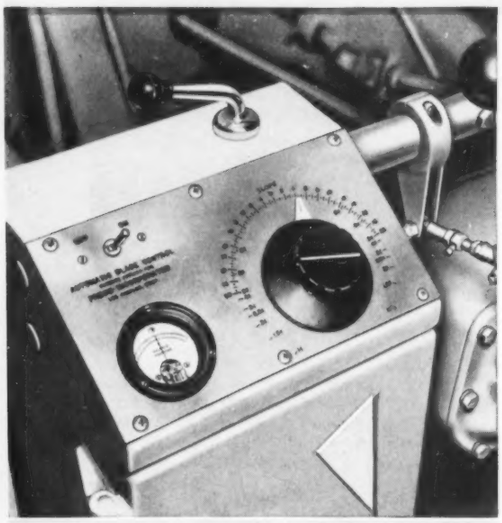
GENCO appoints manager

General Combustion Equipment Co., Alliance, Ohio, has appointed Howard G. Holzum general sales manager. He will be responsible for the development of a sales program on the packaged automatic aggregate temperature control systems.

JOB REPORT FROM NEVADA ON

AUTOMATIC BLADE CONTROL

–AVAILABLE ONLY FOR CAT MOTOR GRADERS!



JUST DIAL THE SLOPE ON THIS PRECO AUTOMATIC BLADE CONTROL...

...IT CONTROLS BLADE SLOPE WITHIN ⅛" IN 10', REGARDLESS OF TERRAIN!

From job after job, reports are coming in about the performance of the Preco Automatic Blade Control, a major feature introduced last year for exclusive use on Cat Motor Graders. How's it doing? Here's a typical answer from Superintendent Bill Hanson of Isbell Constr. Co., Inc., of Reno: "Work on finish is easier with the automatic control and is very accurate." His remarks are the result of work on a 9-mile, 4-lane freeway project near Carson City, Nevada. As for accuracy, controlling blade slope *within ⅛" in 10'* can be done!

More improvements for the No. 12

Though the No. 12 has earned the reputation of "standard of the industry," Caterpillar constantly looks for and finds ways to improve this machine. Automatic blade control is an example. Here are some other, even more recent improvements:

Longer main frame—a 4¾" longer main frame adds extra clearance between toe of blade and front tire for all blade positions.

Better visibility—31% more glass area in cab increases operator's visibility and efficiency.

Increased operator comfort—new seat adjusts fore and aft. Back rest adjustable, too. Cab 6" higher and cab roof insulated to reduce noise level.

Increased versatility—4" longer tandem provides plenty of clearance for chains even when machine is equipped with large 14.00-24 tires.

Have you seen the improved No. 12?

Because of these and other new features, you can count on the No. 12 for even better work—and faster. Look it over at your Caterpillar Dealer. Better still, look it over in action. Have him demonstrate a No. 12 equipped with automatic blade control. See for yourself how it steps up production!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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FOR HIGH PRODUCTION, EQUIP YOUR CAT MOTOR GRADERS WITH AUTOMATIC BLADE CONTROL

←For more facts, circle No. 209

Roofing job goes fast with aluminum decking

Individual sheets of aluminum decking, 25 inches wide and in lengths up to 17 feet, are easily handled by two men installing the roof of the Kaiser aluminum plant in Ravenswood, W. Va.

Roofing a 32-acre plant is a sizable job, but a contractor made fast work of it by having a ten-man crew install about 8,500 square feet of lightweight aluminum decking per day.

The plant is the Kaiser Aluminum & Chemical Corp.'s aluminum producing and prefabricating plant in Ravenswood, W. Va., an industrial installation costing more than $200 million. Almost two million pounds of ribbed aluminum roof decking was used to cover 1,403,656 square feet.

Limbach Co., Pittsburgh, Pa., and the Tri-State Roofing Co., Parkersburg, W. Va., installed the roof, which consists of aluminum decking covered with an aluminum foil vapor barrier, glass fiber insulation, and conventional built-up roofing.

Decking sheets, most of them 15 feet long to cover three purlins, were supplied in lengths up to 17 feet and in widths of 25 inches. They had rectangular ribs, providing good structural efficiency, that were 4 inches wide and 1½ inches deep.

These sheets were first laid and fastened to the purlins, which had an average spacing of seven feet. Each purlin is a 9-inch channel with a flange width of 2⅜ inches. Stainless steel, self-tapping screws with neoprene washers were driven through every other low corrugation.

As decking was installed it was given a coat of Lexsuco vapor barrier adhesive, which was applied with rollers. The vapor barrier, aluminum foil laminated to 40-pound Kraft paper, was then rolled onto the decking, foil side down. This will prevent moisture coming through the roof.

After another coat of Lexsuco adhesive was applied, glass fiber insulating board, 1½ inches thick and in 2×4-foot pieces, was applied to the roof. The built-up roofing consists of four plys of 15-pound coal-tar-saturated felt covered with tar and slag surfacing. Each layer of felt was mopped with 35 pounds of coal-tar pitch per 100 square feet.

Expansion joints were provided every 330 feet in the roof. These are 2-inch spaces, bordered by a 1-foot-high curb on each side. The space is covered by an aluminum cap fastened to one curb. This moves back and forth over the other curb as the roof expands and contracts. THE END

The decking laid, the stainless steel screws fastening it to the roof purlins are driven with a Black & Decker power screwdriver.

● A 195 horsepower diesel engine makes this Huber-Warco the *world's most powerful* motor grader. The builders of the 5D-190 specify Diamond Roller Chain for their unique tandem drive because Diamond transmits full power to the drive wheels regardless of shock loads and twisting stresses.

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Drill teams beat schedule for exploratory tunnel in rock

Four crews—three at one heading, on at the other—excavate 9,370 yards of rock for 8-foot pilot tunnel

One of the three-man crews positions Atlas Copco Lion drills just before sinking blast holes into the granite face of the exploratory tunnel through Rattlesnake Mountain near Cody, Wyo. The 8-foot-diameter tunnel will become part of a new vehicular tunnel.

Four 3-man drilling teams were enough to hole through a 3,440-foot-long and 8-foot-high exploratory pilot tunnel in granite for a new route that will lead to Yellowstone National Park in Wyoming.

This $268,000 project was let by the Wyoming State Highway Department to find out just what type of rock would be encountered when a vehicular tunnel is driven through Rattlesnake Mountain near Cody, Wyo. But when Schmidt Construction Co., Arvada, Colo., began the job, it did not know that it would be working in granite containing quartzite stringers and occasional schist.

Difficult access

When the job got under way, Schmidt crews had to blast a path along a sheer cliff 90 feet above a canyon floor to get to the portal area on the east side of the proposed pilot tunnel. Until actual drilling was ready to start, all supplies and equipment had to be carried to the site by the crews. But once the drilling crews got underground, an aerial tramway was set up to service the workmen.

Drilling crews started working from either side of the mountain. Three of the 3-man crews, working round the clock, were located at the west portal. The fourth crew of three men, working from the east portal, was on a single shift. Thirteen sets of timber structure were required at the west portal, and eight more were used at the 150-foot-long ventilation adit. This 8-foot adit, some 1,423 feet from the east portal, was bored at an incline of slightly more than 5 per cent throughout its total length of 150 feet.

Six Atlas Copco Lion drills—two of them spares—were used to drill the 39 holes per round. These drills, fitted with automatically retracted, semi-integral pusher legs, were teamed with 5-foot 3-inch and 7-foot 10-inch Sandvick Coromant integral steels.

Rock excavated by crews at the western end of the job was removed from the tunnel by 40-cubic-foot rocker cars that had their side walls raised to give them a capacity of 55 cubic feet. Car passes were carved out of the tunnel every 250 feet, so that the units could work easily as they hauled muck out of the tunnel to a

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disposal area a short distance from the existing highway.

Heading crews made an average production of two feet per man per shift. Throughout the job, the Sandvick Coromant steels were sharpened on an Atlas Copco LSB-62 air-powered automatic grinder installed at the central job site.

A total of 8,190 cubic yards of rock, weighing an average of 2.4 tons per yard, was excavated for the pilot tunnel. In addition, another 1,180 cubic yards of rock was excavated for the car passes.

The pilot bore will serve as the crown for the new vehicular tunnel being bored through the mountain to ease a serious traffic bottleneck on one of the main routes to Yellowstone. The new 32-foot-diameter tunnel will be built without a lining, and a fill will link the existing highway and the eastern end of the new tunnel.

THE END

Water quality criteria topic of new bulletin

Bulletin No. 58 from the Engineering Experiment Station at Louisiana State University discusses "The Meaning, Significance, and Expression of Commonly Measured Water Quality Criteria and Potential Pollutants". Written by Howard B. Brown, associate engineer at the station, the bulletin extracts, extends, and clarifies information about water pollution abatement.

Chapters cover such topics as acidity, alkalinity, chlorides, coliform bacteria, oxygen demand, solids, and temperature.

The $1.75 bulletin may be purchased from the Engineering Experiment Station, Louisiana State University, Baton Rouge 3, La.

Buck Equipment licenses British manufacturer

Buck Equipment Corp., Cincinnati, Ohio, has licensed Millars' Machinery Co., Ltd., London, England, to manufacture and distribute Buck Hoistowers throughout the British Isles, the European mainland, and 88 overseas countries.

Maj. Laurence A. Leech, whose firm is a subsidiary of Millars' Timber Trading Co., Ltd., is managing director in charge of the operation.

Seaman-Andwall executive changes

John W. Spoor has been appointed vice president and director of Seaman-Andwall Corp., Division of American-Marietta Co., Milwaukee, Wis., and Jack E. Davis and Michael D'Amato have been elected vice presidents of operations and engineering, respectively. Davis was formerly assistant to the president, and D'Amato was director of engineering.

Spoor was formerly sales vice president of Power Products Corp., Grafton, Wis. In his new position, he is responsible for sales, distribution, and merchandising of all Seaman-Andwall product lines.

Clark Equipment appoints

The Clark Equipment Co., Construction Machinery Division, Benton Harbor, Mich., has appointed John A. Allsup, John A. Halleran, and Orland K. Noel field representatives. Allsup will service the plains states; Halleran, the northwestern states; and Noel, the southeastern states.

Templeton, Kenly news

William E. Holmes has been appointed sales engineer for Templeton, Kenley & Co., Broadview, Ill. He will cover Wisconsin, Missouri, central and southern Illinois, northern and southern Indiana, Iowa, Kansas, western Kentucky, and southwestern Michigan.

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4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
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The two contractors, though working from the same quarry, use different methods. Skousen-Hise Contracting Co., Albuquerque, N. Mex., has a Koehring Dumptor haul from a shovel at the pit to the Pioneer primary 30×42 crusher. Material goes to the 46VE duplex secondary unit, then to the surge bin, right.

Crushing, grading are biggest jobs on Interstate project

Two ways used to produce base, concrete aggregates; rippers and scrapers team for cuts in tough rock

Quarrying a thin layer of limestone on top of a remote, high mesa, two contractors produced aggregates for base and paving on two adjoining sections of U. S. 66 across the Continental Divide in northwestern New Mexico.

Although sheer rock seems to dominate the landscape, the contractors had to build four miles of haul road from the highway to the top of the mesa to reach a source of suitable rock for aggregates. Even then, the usable rock was only a thin ledge, ranging from 5 to 8 feet deep, and it was difficult to quarry with economy.

Both of the $1.3 million contracts were for 5-plus-mile sections of four-lane divided highway on the Interstate System. The contractors were Henry Thygesen & Co. and Skousen-Hise Contracting Co., both of Albuquerque, N. Mex. The projects were planned and supervised by the New

Henry Thygesen & Co., of Albuquerque, uses tractors to push rock from the pit to a stockpile near the crusher. This breaks the rock and allows fines to sift out. On the stockpile, an Allis-Chalmers tractor-dozer pushes rock to the crusher. Finished material is being loaded out from the hopper at right.

As Thygesen's 28×40-inch Cedarapids primary operates, it screens out fines that are carried away by the conveyor at left. This crushing unit is powered by a Cat D8800. Behind the conveyor are the surge bins and belts leading to the secondary plant.

Ripping is tough in some of the rock cuts where material does not have to be blasted. In this cut, an Allis-Chalmers HD-21 uses a Tracto-Ripper to break the rock.

Excavation of unclassified material, which ran to rock, is handled here by an International 2T-75 Payscraper. An Allis-Chalmers HD-20 tractor helps the scraper to pick up a full load.

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Mexico State Highway Department.

Grading to Interstate standards through the rocky, mountainous terrain at the top of the Continental Divide is a tough job in itself. But this project was complicated at the start by the fact that the new highway follows the old alignment, and traffic had to be carried through the work at all times. One roadway had to be completely graded and surfaced first so that it could carry traffic while grading of the second roadway obliterated the old road.

This meant that both the highway engineers and the contractors had the tough job of balancing quantities so that the first roadway could be completed without destroying the old road, and so that there was a minimum of construction machinery crossing highway traffic.

Quarry at high elevation

Another complicating factor was that all kinds of construction rigs had to be operated at altitudes well over a mile above sea level. The job of quarrying and crushing the quarry rock for aggregates was done at an elevation of 7,800 feet. And the thin air at this height had an effect on both men and machines.

Although both contractors produced aggregates from the same quarry, and for similar uses, their quarrying and crushing methods were not the same. One of the chief differences was that one contractor loaded the rock with a power shovel and hauled it to the crusher with trucks, while the other contractor brought the rock from the quarry to the crusher with big tractor-dozers.

In the Skousen-Hise quarry, a Caterpillar D8 tractor carrying two Gardner-Denver drills and a Gardner-Denver 500-cfm compressor, drilled the blast holes in the 6 to 8-foot ledge of rock. The drills were mounted on arms on the front of the tractor; the compressor was mounted on the rear of the tractor and driven by the tractor engine. This same rig also drilled for blasts in the rock cuts on the road.

The shot rock was loaded by a shovel to a pair of Euclid end-dump trucks. These were sometimes assisted by two Koehring Dumptors. The haul rigs climbed a ramp and dumped into the apron feeder of the Pioneer primary crushing unit. This consisted of a Pioneer 30×42 jaw crusher. A 30-inch conveyor, 50 feet long, carried the crushed material to the secondary unit.

The secondary plant, a Pioneer 46VE duplex unit, was driven by electric motors that were powered by a Murphy diesel generator set. Included in this unit were a 10×36 jaw crusher, a set of 40×22 rolls and a 4×12-foot five-deck screen. Conveyors carried the finished materials to surge bins at both sides of the plant, and trucks, loaded by gravity from these bins, hauled to the roadway.

This setup produced an average of 1,200 tons of minus 2-inch base ma-

(*Continued on next page*)

Sand, to be mixed with crushed rock for the base material, is produced in this pit by Skousen-Hise. Brought to the trap by tractor-dozer, it goes up the Barber-Greene conveyor to a grizzly that removes rock. Sand is loaded into the Schonrock 2-yard cable dump pulled by the Mack truck.

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One of the secondary plants used by Thygesen is this Universal, which is producing ⅜-inch chips.

Aggregates for concrete used in culverts are batched from these CMC elevated bins. The Scoopmobile, left, charges the bins with two sizes of aggregate. The truck being loaded delivers batches to a mixer at the job site.

terial per 8-hour day, or approximately 600 tons of ¾-inch hot-mix aggregate per day. This contract called for 150,000 tons of base-course material.

Use two secondary units

A few feet away on the same hilltop were the quarry and crushing setup of Henry Thygesen & Co. Here, the same kind of tractor-mounted drill unit put down the 6-foot-deep blast holes on about a 6-foot-square pattern. The holes were loaded with 2½-inch sticks of 40 per cent dynamite, which produced good fragmentation.

Three tractor-dozers took over the job of moving the blasted rock to the crusher. These were D8 and D9 tractors and an Allis-Chalmers HD-21. The D8 and D9 worked the rock from the quarry into a stockpile near the crusher. The D9 was equipped with a ripper which was frequently used to break out the larger chunks and to separate the rock so that it could be moved by the dozers.

As the dozers moved the rock, there was a great deal of additional breakage; the product delivered to the crushers was much smaller in size than that first moved from the quarry. At the same time, much of the very fine material sifted down through the rock being moved and was left on the quarry floor.

The HD-21 tractor-dozer pushed the rock up the stockpile and into the apron feeder of the Cedarapids 28×40 jaw crusher. The primary unit also included a fine screen which removed the dust before sending the crushed rock along to the secondary units.

A belt carried the minus 3-inch material from the primary crusher to a splitting chute. This sent the material to two surge bins, each supplying one of the secondary units. One of the secondaries was a Universal 880 Super Senior Gravelmaster portable crusher combining jaw and roll crushers, and a screening unit. The other was a Cedarapids 1100 unit, which also combined jaw and roll crushers with a screening unit. The two secondary units could be set up to produce either the same or different materials. In one instance, while the Universal plant was producing ⅜-inch chips, the Cedarapids plant was making ⅝-inch chips.

Add sand for base

Sand was added to the crushed rock to make the base-course material.

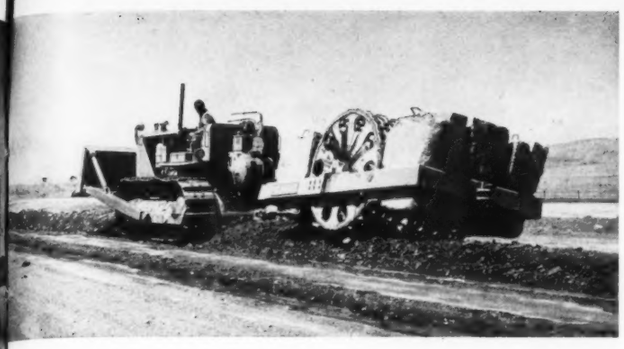
All over the world, where work conditions are extra tough, you'll find dependable Cat Engines powering the job

In mud, rock, blazing heat and below-zero cold, the fine-tolerance workmanship of rugged Caterpillar* Diesel Engines keeps the job running on schedule. Wherever steady production is of prime importance, these same basic characteristics—from smooth lugging to the ability to idle for long periods—make CAT* Engines first choice for power shovels, cranes and draglines.

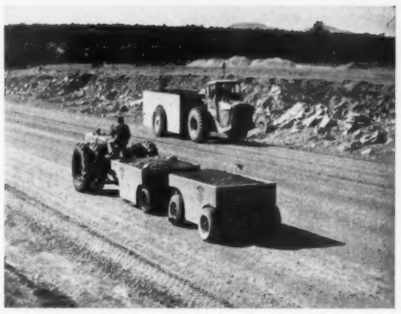
When Caterpillar Tractor Co. first designed it diesel, it paid special attention to durability, trouble-free fuel injection system, and the capaci to burn a wide range of fuel. Because these feature pay off on the job site, Caterpillar Diesel Engines a the keystone of the construction industry. And th fact you can count on them *not* to fail, idling dow other equipment, gives these rugged power units

Several Marion draglines, a Koehring dragline and a P&H dragline—all depend on Cat Engine power to keep the job on schedule excavating in this glacial till and sticky gumbo mud.

Shovel power is furnished by Caterpillar Diesel D375s and a D3 on construction of the Grasse River Lock on the St. Lawrence Pow Project, near Massena, New York.



As traffic begins to use the first half of the new roadway, crews start breaking up the old road with a Hyster grid roller pulled by a D8. The roller carries concrete weights to help pulverize a windrow of old surfacing.



Base compaction on the first roadway is done by Tampo and Grace 11-wheel rollers pulled in tandem by an International tractor, and a Tampo 50-ton pneumatic roller pulled by a LeTourneau-Westinghouse 2-wheel tractor.

Both contractors had similar loading setups in a sand deposit adjacent to the road leading to the quarry. The Skousen-Hise setup included D7 and D8 tractors with dozers, which pushed the sand up to a trap feeding a Barber-Greene belt conveyor. A grizzly at the end of the conveyor removed the stones and chunks as the rest of the sand fell through into trucks hauling to the roadway.

On the roadway, the sand and stone were laid down in measured proportions by the trucks, mixed by Caterpillar No. 12 motor graders, and watered. When thoroughly mixed and moistened to optimum, the materials were laid out in 4-inch-maximum courses by the motor graders. Compaction was handled first by Tampo and Grace 11-wheel rollers pulled by an International tractor, and then by 50-ton rubber-tire rollers. S-H had two of these big rollers, one Tampo with a LeTourneau-Westinghouse 2-wheel tractor attached and the other a Miller & Smith pulled by an International TD-18 tractor.

Built to the Interstate standards, the typical highway section had the two roadways spaced 66 feet center to center. Each roadway was graded to a 50-foot top with slopes ranging from ½ to 1 in. rock to as flat as 4 to 1. The space between the roadways is normally a depressed median. The base was then built up of 14 inches of material consisting of 70 per cent 2-inch crushed rock and 30 per cent sand. This was placed in four layers. The final base course consisted of a 3-inch lift of 1-inch rock and sand. Three inches of hot-mix bituminous surfacing completed the roadway.

The first bituminous course was placed 38 feet wide to cover a 24-foot roadway, 10-foot outside shoulder, and 4-foot inside shoulder. The second course was placed just the 24-foot width of the roadway. The shoulders were later given an application of light-colored chips to delineate the roadway.

Grade during winter

Both contractors worked in the rock cuts when weather conditions were not suitable for earthmoving. Some rock was ripped and loaded by scrapers, but both contractors had to drill and blast rock in other areas. The equipment used for this operation was later moved to the quarries.

For the unclassified excavation, which ran heavy to rock, Thygesen

(*Continued on page 24*)

←For more facts, use coupon or circle No. 214

ow *final* price the economy-minded spread owner an't afford to pass up.

Specify engine power by Caterpillar in your next hovel—or repower with a Cat Engine in a shovel hat's working, but not hard enough. You can depend n the honest horsepower ratings of Cat Engines and heir economy, durability, and sure-fire reliability. four Caterpillar Dealer can show the right fit of ower for any job, from the rugged D311 (65 HP, aximum output capacity) to the heavy-duty D397 650 HP, maximum output capacity).

ngine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

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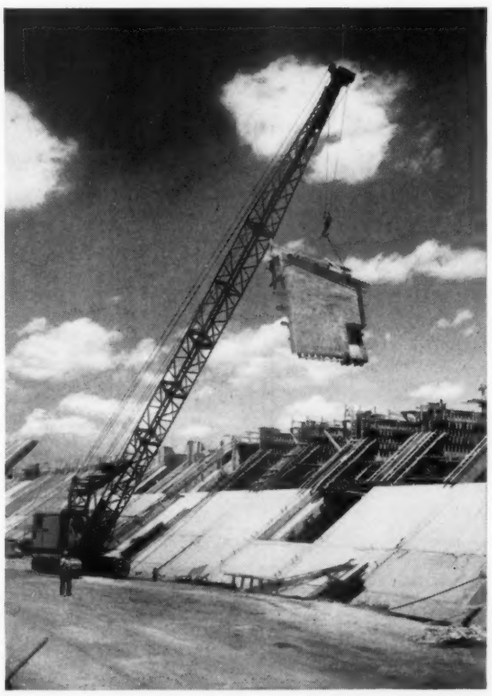
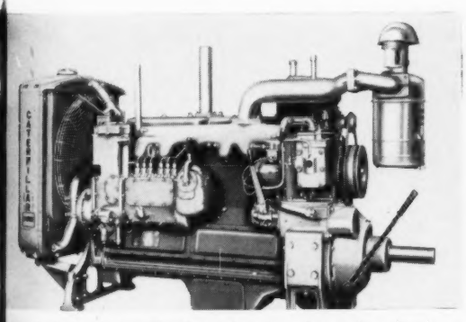
rain crane, handling forms for spillway on dam construction uth of Mathis, Texas, is powered by dependable Cat D337 Engine. Like that Caterpillar equipment!" says project supt. J. A. Downey . B. Zachry Co.). "The rest of our equipment shows we prefer aterpillar machines for our money when it comes to moving dirt eaply: 26 D8s; 5 D7s; 9 D6s; 5 D4s; 1 D9; 8 DW20s; 6 DW10s."





ypical of the Caterpillar line of modern, heavy-duty diesel en- ines is this sturdy Cat D318 Engine. Rated at 137 HP (maximum utput capacity), its four-cycle design provides a smooth, effective ower stroke with an efficient utilization of power. This feature, us Caterpillar's long life and minimum of maintenance, pay off dependable service and profitable production.

This Bucyrus-Erie shovel, working on construction of a road to the railroad bridge being built on the Northern Pacific Railroad relocation project near Cumberland, Washington, is powered by rugged Caterpillar Diesel D318 . . . "They're dependable. We don't want any trouble so we get Cat Engines!" says the job superintendent for Hamilton-Thoms, owner.

BY CATERPILLAR

Cylinder liners typical of quality in Cat Engines Full-length, wet-type liners in all Cat Engines give more efficient heat transfer — reducing maintenance costs. Direct contact of liner and coolant means you can be sure of long liner and ring life.

Dept. CT2, Engine Division
CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

Send me more information about Caterpillar Diesel Engines for prime and repowering use in the construction field. I have checked the proper box to guide your selection of material.

☐ I would like detailed information, as I may be in the market for a Cat Diesel Engine or Electric Set. I understand I am under no obligation.
☐ I am interested in learning more about these engines.

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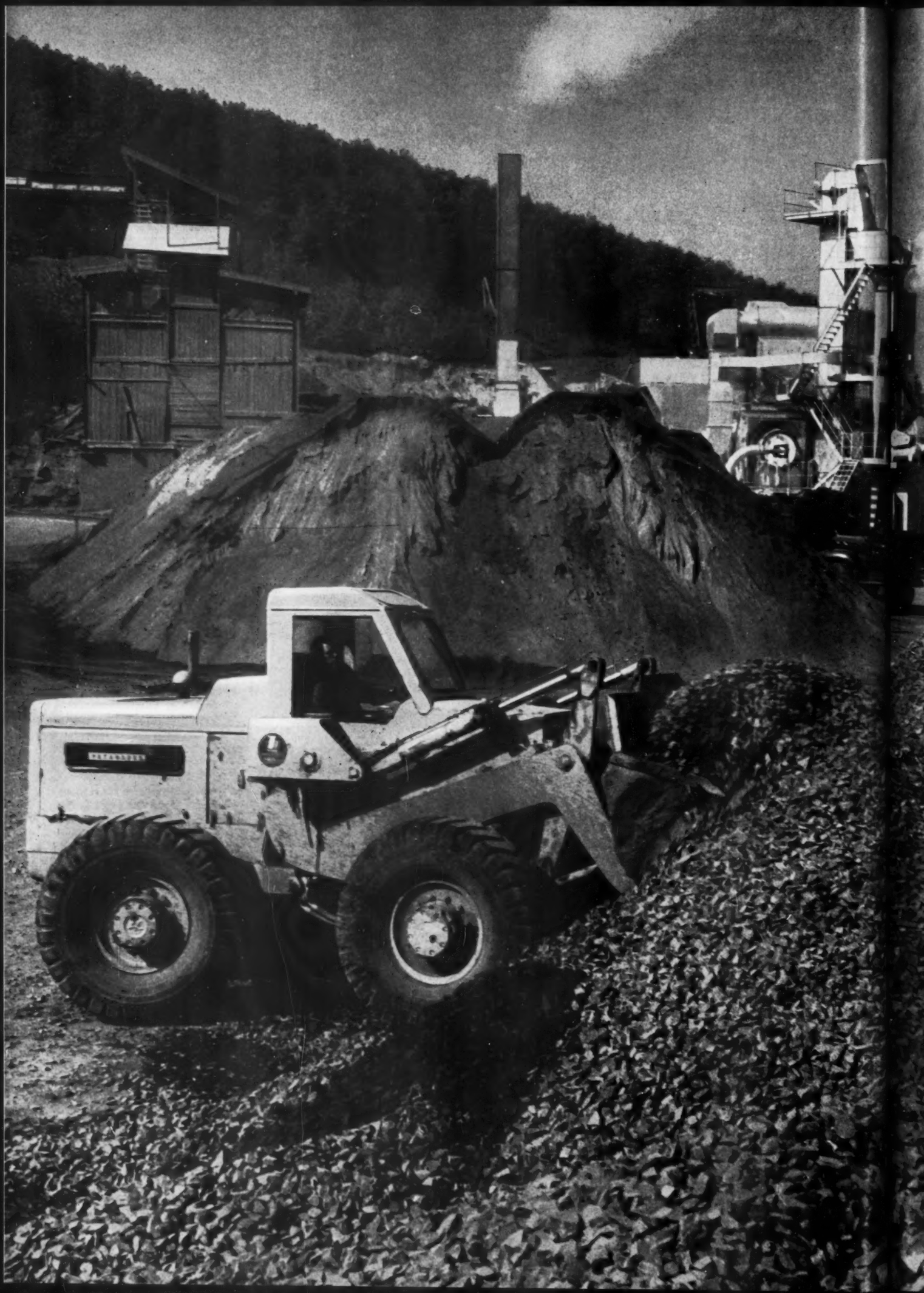
*City*_____ *Zone*____ *State*_____



How does this model HO PAYLOADER® outproduce bigger, heavier loaders?

Claims don't mean a thing until they're proven. It's performance and production that counts with operators and users . . . on the job site! Exclusive PAYLOADER features make it possible for this model HO to "definitely outproduce bigger, heavier loaders," according to owners using all makes of tractor-shovels.

How is this done?

√ You get a FULL load to start with . . .

√ You KEEP a BIGGER load with a 40° tip-back of the bucket at GROUND LEVEL!

√ You can carry the load LOWER and CLOSER to the machine for BETTER STABILITY!

√ With LOAD SHOCK ABSORBER you spill less, retain more of the load while traveling!

√ With NO-STOP power-shift transmission you complete faster cycles . . .

√ With better weight distribution you eliminate excessive dead weight and engine horsepower . . . get MORE CARRYING CAPACITY per pound of machine!

√ Since you GET MORE . . . SPILL LESS . . . and complete faster cycles . . . you DELIVER MORE . . .

√ and that is what PAYS OFF!

It's no wonder that there are more PAYLOADER unit-design, rubber-tired tractor-shovels in use than all other makes combined. Arrange for a demonstration with your nearby Hough Distributor and prove to yourself that PAYLOADER gives you more profitable production.

SAY "HUFF"

Modern Materials Handling Equipment

THE FRANK G. HOUGH CO.

LIBERTYVILLE, ILLINOIS

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Ask about...

PURCHASE AND HOUGH LEASE PLANS

Now your Hough Distributor has at his disposal the broadest and most complete set of financing plans ever offered: — TIME PAYMENT . . . LEASING PLANS,* with or without OPTION TO PURCHASE — any and all kinds of financing to best fit your needs for the purchase of "PAYLOADER" equipment. See him today.

* *Available in Continental U.S.A.*

THE FRANK G. HOUGH CO.

762 Sunnyside Ave., Libertyville, Ill.

Send more data on 4-wheel-drive "PAYLOADER" tractor-shovels as checked:

☐ HO — 9,000 lb. carry cap. (1 to 4 cu. yd. buckets)

☐ HH — 7,000 lb. carry cap. (⅞ to 3¼ cu. yd. buckets)

☐ HU — 5,000 lb. carry cap. (⅜ to 2⅛ cu. yd. buckets)

NAME_____

TITLE_____

COMPANY_____

STREET_____

CITY_____ STATE_____

2-B-1

For more facts, use coupon or circle No. 215

A combination of equipment works at grading. The Cat DW20, foreground, is push-loaded by an Allis-Chalmers HD-20 tractor. Just behind is another scraper-pusher combination.

(Continued from page 21)

used Allis-Chalmers HD-20 and HD-21 tractors equipped with Tracto-Rippers for both ripping and push-loading. The material was loaded and hauled by a scraper spread which included an International 2T-75 Pay-scraper, a Euclid scraper, a Caterpillar DW20 scraper and a D8 and 80 scraper. This spread moved 387,000 cubic yards of unclassified excavation and brought in 86,000 yards of borrow.

To move the 443,000 cubic yards of unclassified excavation and 92,000 cubic yards of borrow in its section, Skousen-Hise used a Euclid scraper, an International 2T-75 scraper, and a D8 and 80 scraper with a D8 push-tractor. At the height of the work, two more "Euc" scrapers were added, together with a D9 pusher. The shovel and Euclid end-dumps removed some of the rock that had to be blasted.

Bituminous paving

Thygesen was the first to get started with the bituminous paving. The mix was produced by a Pioneer all-electric plant powered by two D13000 generator units. A P&H truck-crane with a ¾-yard clamshell bucket fed the aggregates to the three-compartment, 125-yard bin. Calibrated gates and plate feeders delivered the desired proportions to a belt conveyor supplying the dryer. The hot, dried materials were raised to a gradation unit, then proportioned and delivered to the twin pugmills where the asphalt cement was added. The plant produced 120 to 150 tons per hour.

The base was primed with MC-1 cutback asphalt by a Rosco 2,250-gallon distributor and tacked with asphalt cement before two Barber-Greene pavers laid the hot-mix. The shoulders were later sealed with 120 to 150-penetration asphalt and covered with chips placed by a Hi-Way spreader.

Personnel

Supervising the work for Henry Thygesen & Co. was Paul Cross. His crushing foreman was G. S. Meador. The Skousen-Hise contract was supervised by Phil Johnston, a partner of the firm. G. M. Johnson was crushing foreman on this contract.

Representing the state of New Mexico were project engineer Lee Richards, and his assistant, Fred Schilling. The chief highway engineer for the New Mexico State Highway Department is L. D. Wilson. The construction engineer is H. F. Leslie.

THE END

Thor appoints seven new district sales managers

Thor Power Tool Co., Aurora, Ill., has appointed seven district sales managers. Walter R. Smith takes over the Milwaukee branch, replacing Clarence B. Bergren, who was made manager of Thor electric and Speed-Tool sales. Theodore E. Vocker fills Smith's former post of St. Louis, Mo., branch manager.

Also appointed are Harry L. Groves to the Houston, Texas, branch; Martin A. Bertram to the Cincinnati branch; Samuel P. Gartland to the Boston, Mass., branch; Thomas J. Murphy to the Buffalo, N. Y., branch; and James Q. Golden to the Atlanta, Ga., branch.

Universal Atlas promotes

Universal Atlas Cement Co., Chicago, Ill., has promoted Frank J. Whitman, former sales manager of the Chicago territory, to manager of sales, Central region, with headquarters at Chicago. Wilbur M. Tomlinson, former sales manager, Kansas City, Mo., has been made manager of sales, Western region, with headquarters at Kansas City.

First transistor-powered mobile radios up to 60 watts

General Electric's Progress Line mobile radios now offer transistor advantages in all bands.

New transistorized power supply for both transmitters and receivers means no vibrators to replace, no rotating or vibrating parts to wear out. Transistors, plus high quality silicon rectifiers, give you the most dependable mobile communication known today.

Progress Line mobile radios with transistorized power supplies are available in *all* communication bands: 30 or 60 watts in low band (25-54 mc), 25 or 50 watts in high band (144-174 mc), or 15 watts in UHF band (450-470 mc).

OPERATE FROM EITHER BATTERY POLARITY—Only General Electric's Progress Line lets you operate on either positively or negatively grounded 12 volt batteries. This is especially important in fleet operations.

IMPROVED RANGE—Vibrator hash usually associated with receivers is totally eliminated by the use of transistors. The result is maximum receiver sensitivity.

NOT DAMAGED BY VOLTAGE VARIATIONS—Unlike vibrators, transistorized power supplies can withstand battery voltage variations from +20 to −50 percent.

PROGRESS WITHOUT OBSOLESCENCE—No need to buy new power cable or control head. General Electric Progress Line mobile units with either new transistorized power supply or regular vibrator power supply are *completely interchangeable.*

Call your G-E communications consultant for full details. He's listed under "Radio Communication Equipment" in the Yellow Pages. Or write General Electric Company, Communication Products Department, Section 30258, Syracuse, N.Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

For more facts, use Request Card at page 18 and circle No. 216

Maintenance fleet keeps N. Y. Thruway open

The New York State Thruway Authority is spending approximately $1,350,000 this winter in an all-out effort to keep the cross-state superhighway free of ice and snow. The 600 Thruway maintenance workers are available on a 24-hour-per-day schedule, whenever necessary, to man more than 550 snowplows, trucks, salt spreaders, scrapers, and other types of equipment along the route.

Each section headquarters along the Thruway has a shed containing 400 tons of salt. An estimated 45,000 tons of chlorides will be used to combat ice and snow before winter is over.

In the snow-removal operations on the 4-lane sections of the Thruway, a large truck equipped with a snowplow, or two small trucks, plow to the left down the passing lane to push the snow over the inside shoulder onto the median. The trucks have a large yellow and black reflectorized sign on the back, with an arrow, saying, "Pass to the Right".

About 750 feet behind these trucks is another unit or group of plow-equipped vehicles that plow the snow from the driving lane onto the outer or right shoulder of the pavement. These trucks carry signs reading, "Pass to the Left". In this way, traffic can get between the two groups of plows without hitting a ridge of piled snow. They pass to the left of the first group of plows they overtake and to the right of the second group.

On the 6-lane sections, a different procedure is used. Two trucks in echelon, plowing to the right, are sent down the center and part of the right-hand lane. These trucks are followed by another that finishes the job of cleaning the right-hand lane and part of the shoulder. This truck travels about 750 feet behind the first two. A fourth truck, traveling 750 feet farther to the rear and plowing to the left, removes the snow from the lane adjacent to the median. The first three trucks carry "Pass to the Left" signs and the last truck carries a "Pass to the Right" sign. With this procedure traffic can pass the plowing units without crossing a snow windrow.

Lead cab protects tractor operator from radiation

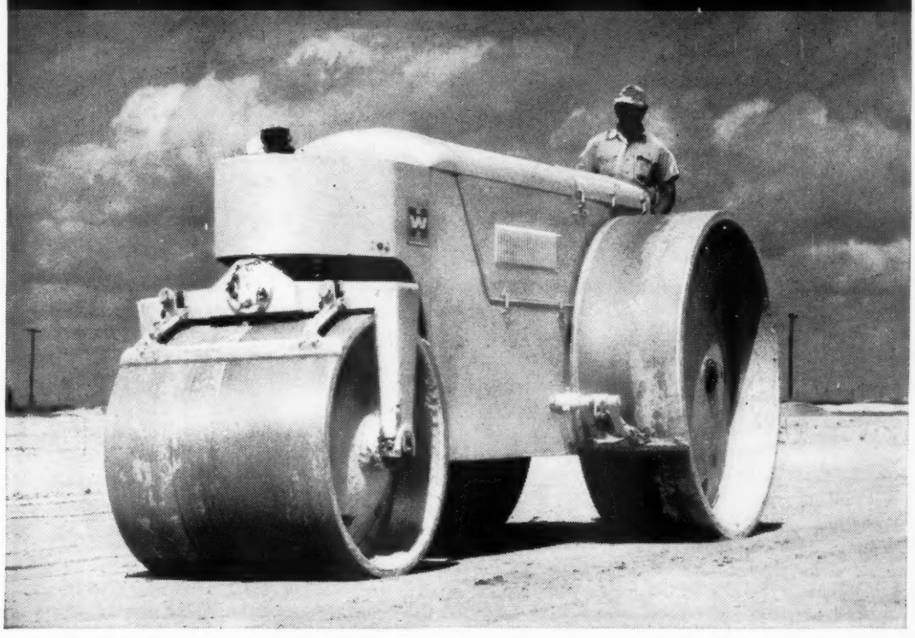
A unique cab, that protects a bulldozer operator from radiation while working in a contaminated area, has been developed by the Special Projects Branch of the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

This 5,000-pound lead cab will allow army engineers to start early clean-up operations of radioactive areas following a nuclear blast.

Visibility is provided by lead glass windows on each of the four sides of the cab, which has space for operator, tractor controls, radio, and special radiation meters that record the amount of radioactivity in the area.

Successful tests on the cab were conducted at Fort McClellan, Ala., and at Yucca Flat, Nev.

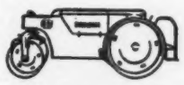
HUBER-WARCO 3-Wheel rollers

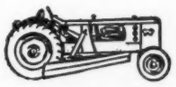


torque converter for greater efficiency

The Huber-Warco 3-WHEEL ROLLER is a powerful, rugged machine built for economy, performance and durability. A combination of torque converter, tail-shaft governor and 2-speed transmission adds to the efficiency . . . doubles available power and supplies it instantly . . . cuts fuel consumption . . . maintains rolling speeds automatically at any set speed. Both standard and variable weight models are available. See your Huber-Warco distributor for complete details.

TANDEM ROLLERS


3-WHEEL ROLLERS


MAINTAINER

MOTOR GRADERS

Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.

☐ Send specifications on Huber-Warco 3-wheel rollers.

Send specifications on: ☐ Maintainer ☐ Motor Graders ☐ Tandem Rollers

Name _____

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Company _____

Address _____

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HUBER W WARCO

2-CE

For more facts, use Request Card at page 18 and circle No. 217

Blacktop goes down despite bad weather

The 88.5-mile Will Rogers Turnpike in Oklahoma is completed on schedule —and with $10 million surplus

Two pavers—a Pioneer Vibromatic working ahead of a Barber-Greene finisher—lay the 24-foot wearing course for the Will Rogers Turnpike in Oklahoma.

Fast blacktop paving—despite intermittent spells of rainy weather—brought the 88.5-mile Will Rogers Turnpike in Oklahoma to completion on schedule.

The sun was shining, however, when the Oklahoma Turnpike Authority reported that they would completely finish the project with a $10 million surplus. The surplus came about partly because the original $68 million bond issue for the road was set up with a $6.5 million contingency reserve. It has not been necessary to spend the reserve fund, and construction costs have run somewhat below engineers' estimates.

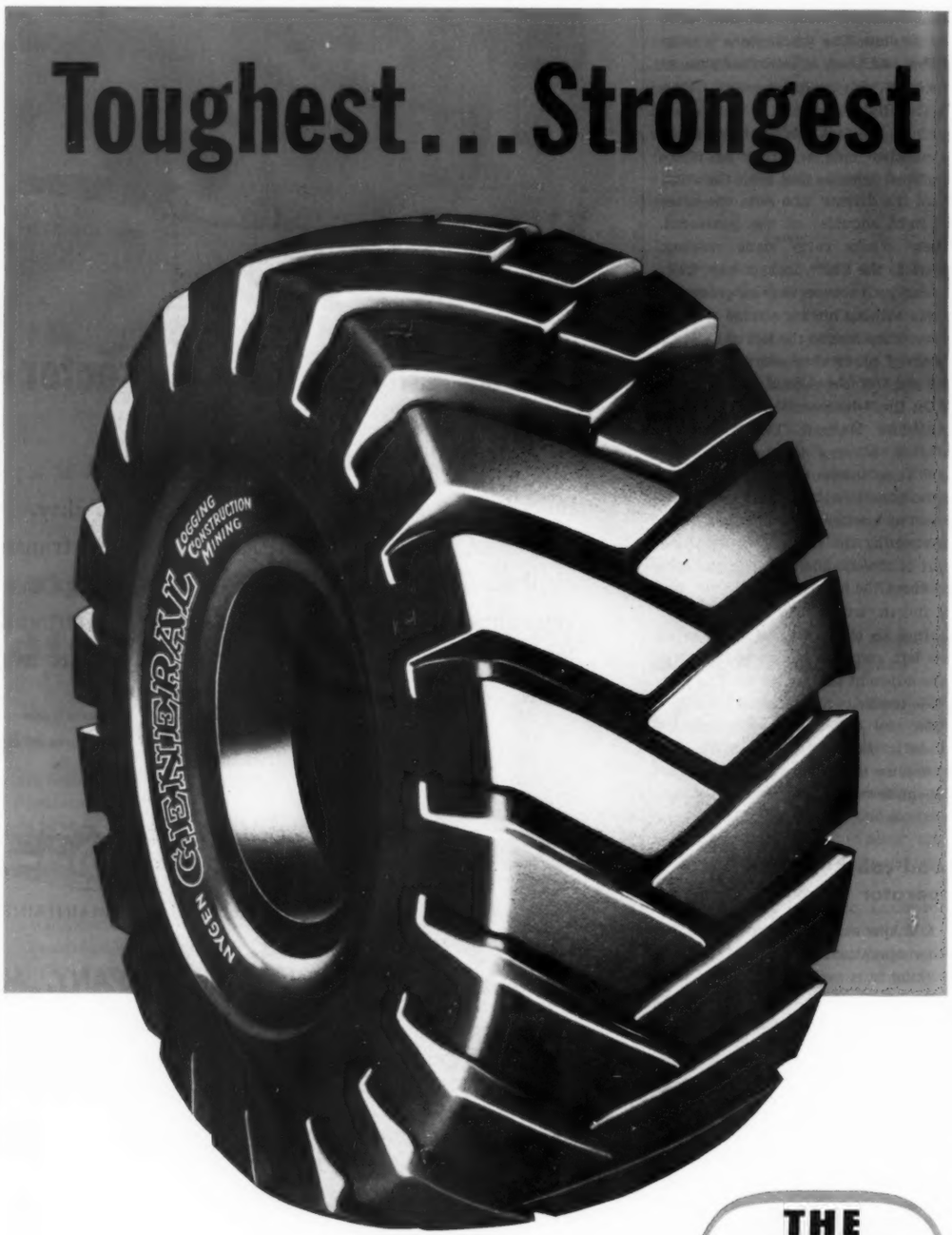
A screwman on the back of the B-G finisher checks the slope of the 2-inch wearing course with a level. The roadway slopes from the median at ⅛ inch per foot, and a ⅜-inch support is used at the lower end of the level.

This modern toll road runs from Tulsa to the northeast corner of the state where the turnpike joins U. S. 166 in Missouri. Designed for fast and safe driving, the road has a maximum grade of 3 per cent and a minimum visibility of 1,100 feet. The greatest degree of curve is 36 minutes. Curves are so slight that no superelevation of the roadway has been necessary.

The two 24-foot roadways are separated by a 15-foot raised grass median, and 12-foot paved shoulders provide an additional margin of safety. There are reflecting delineators every 200 feet on the edges of the shoulders and the center of the median. Continuous steel-plate guardrails protect motorists on fills over 10 feet. This highway has practically everything but horns at 500-foot intervals to keep the driver from falling asleep.

Paving operations

Although the roadway in the vicinity of the five interchanges is of concrete, as are the ramps, the greater part of the turnpike has a bituminous

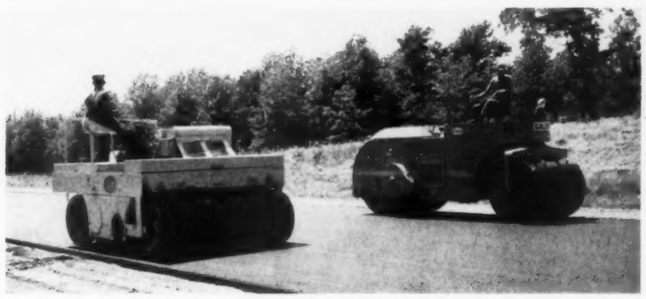


Specify Generals on your new equipment

THE GENERAL TRUCK TIRE

Wear on brakes and spillage are eliminated when this Ford truck dumps to the B-G finisher on the downgrade. The truck is tied to the finisher by a chain that runs under the truck to be attached to a V-plate welded to the front bumper.

An unloaded Welco rubber-tire roller, used to give a sealing and kneading action to the surface, works near the Galion Roll-O-Matic 10-ton finishing roller that keeps just behind the pavers.



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C CONSTRUCTION
M MINING

built with NYGEN®
deeper huskier TREAD
crawler-like FLOTATION
low rolling RESISTANCE
grouser-type TRACTION

No matter what the job, weather, or terrain, this big husky new General LCM is your assurance of dependable, profitable all-round performance.

Featuring the amazing strength of Nygen cord plus a wider and heavier tread, this great new LCM gives you flotation and traction beyond all comparison.

Choose your toughest job and then choose the dependable, deep-bite performance of the all new General LCM.

THE GENERAL TIRE & RUBBER COMPANY
Akron, Ohio

For more facts, use Request Card at page 18 and circle No. 218

pavement. Typical of the many contractors who took part in laying the 88.5 miles of blacktop, was Metropolitan Construction Co., Oklahoma City. Under a subcontract from Burbank Rock Co., Ponca City, Okla., Metropolitan paved a 4.5-mile section near the northern end of the pike.

Aggregate from mine dump

The contractor had a convenient source of aggregate for his hot-mix plant, although the nature of the material itself presented some problems. It was hard, flinty chert, found in abundance in a waste dump of an abandoned lead and zinc mine only 2 miles from the project. Although the chert was mixed with crushed limestone and field sand, the resulting mixture was still difficult to work. The hard, smooth surface of the chert made it difficult to get the specified stability in the mix. In addition, the chert caused a considerable amount of wear in the plant and the finishing machines.

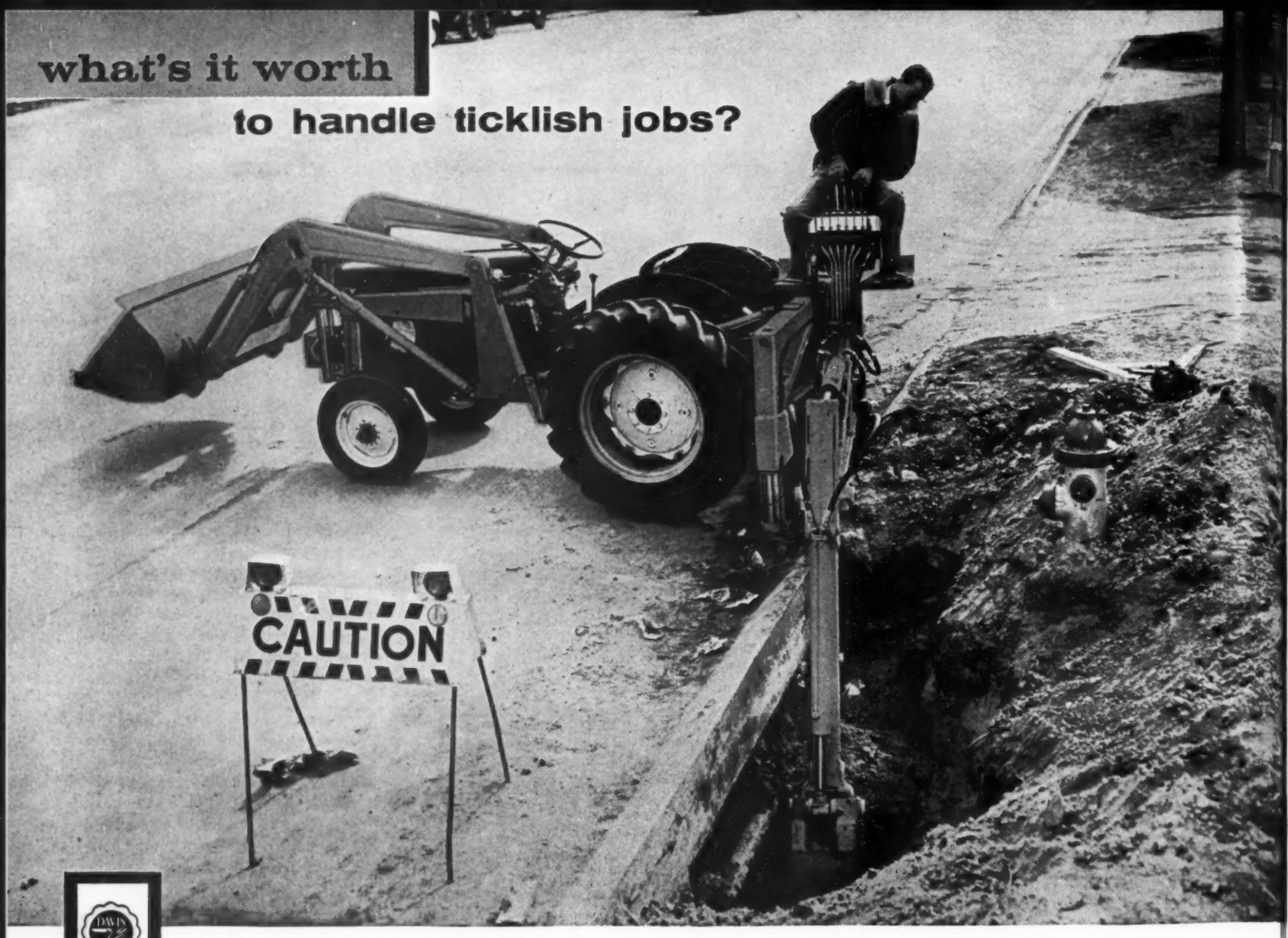
Adjacent to the mine dump and the aggregate stockpiles was the contractor's portable Barber-Greene plant. This continuous-type plant of the Model 848 series can put out 140 tons per hour under good conditions. But production was down to about 110 tons per hour because the dryer could handle only a limited amount of the wet aggregate.

Stocking the four cold-feed bins of the plant with three different sizes of aggregates was a Bay City ¾-yard crane. The aggregate proportions for the Type B wearing course were 25 per cent ¾-inch crushed limestone; 60 per cent ⅜-inch mill-run chert; and 15 per cent field sand. The binder course contained 80 per cent of the mill-run chert; the remaining 20 per cent was field sand. The surface course had 7.2 per cent asphalt mixed with the aggregate; and the binder course, 6.0 per cent.

Tank trucks kept the plant supplied with asphalt from the D-X Sunray Oil Co. in Tulsa. Crushed limestone was also trucked into the job by the Southwest Rock & Chatt Co. of Baxter Springs, Kans. Shuttling between the plant and the finishing machines with loads of hot asphalt was a fleet of about ten Chevrolet and Ford dump trucks. The average

(Continued on page 29)

what's it worth to handle ticklish jobs?



DAVIS BACKHOE lets you work in Tight Spots!

Digs flush when you need to — only the Model 210 Davis Backhoe has the ability to dig flush alongside walls, buildings, fences. Has 200° continuous operating arc.

A Davis Loader and Backhoe combination will put money in your pocket by outperforming any other rig — pound for pound, dollar for dollar.

Digging near pipelines, conduits, utility mains, or other hidden obstructions is always a tough assignment... but a Davis Backhoe will let you handle those ticklish jobs easier and quicker with more safety and profit than any other make. Here's why!

DAVIS LETS YOU SEE YOUR WORK — Unobstructed visibility lets you work fast and accurately without having to "feel" your way around concealed objects or depend upon shouts and hand signals for instructions. Both seat and finger-tip controls swing with the boom, so you always face your work.

DAVIS HAS "ALERT" CONTROLS — Boom, dipper stick, bucket, and stabilizer foot respond lightening-fast to your command.

DAVIS GIVES MAXIMUM MANEUVERABILITY — Because of its exclusive flush digging feature, 200° continuous operating arc, and ability to dig at right angles, Davis lets you operate in places inaccessible to other machines. You can often complete jobs in the time it takes other makes to maneuver into position!... ***YET DAVIS STILL COSTS LESS THAN MOST OTHER MAKES!***

Davis Loaders and Backhoes are available for all popular models of International, Ford, Fordson Major, Ferguson, Case, Massey-Harris, Allis-Chalmers, Oliver, John Deere, Minneapolis-Moline, and Work Bull Tractors.

SOLD AND SERVICED EVERYWHERE BY BETTER DEALERS

For the name of your nearest dealers call Western Union by number and ask for Operator 25... or write direct. Please specify make of tractor.

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For more facts, use Request Card at page 18 and circle No. 219

(Continued from page 27)

length of haul to the laydown area was about four miles.

Hot joint requires two finishers

Since the specifications called for a hot rolled joint to bond the two traffic lanes, two paving machines were needed to lay the 3-inch binder course and 2-inch wearing course. Working one behind the other on adjacent lanes, a Barber-Greene and a Pioneer Vibromatic bituminous paver laid the 24-foot-wide mat. Since the pavers could handle more asphalt than the plant produced, dump trucks alternated their loads to the two pavers. On a good day, the contractor was able to lay down 1,150 tons of the binder course.

An effective method of tying the dump trucks to the paver—not often used in a blacktop operation—was used by the contractor. Usually, the paver pushes against the wheels of the dump truck and there is no tie between the two machines. On downgrades the truck driver has to keep his brakes on to avoid rolling away from the paver. But on this job, a chain connected to the front of the paver ran under the truck body and was secured in a "V" plate welded to the front bumper. This method saved on the brakes and eliminated spillage.

Rolling

Working close behind the pavers was a Galion tandem roller. As the 10-ton roller worked up and down the hot asphalt, it sealed the slightly crowded joint between the two lanes. Following this roller was a Welco self-propelled rubber-tire roller which gave a sealing and kneading action to the surface. The rubber-tire roller was used only on the wearing course. The final piece of equipment in the paving parade was a Huber 10-ton tandem roller, which brought the asphalt to its required compaction.

Personnel

The consulting engineers for the over-all project were De Leuw Cather & Co. Under their supervision were the consulting engineers who designed and supervised construction in their individual sections. Fell & Wheeler was the consulting engineer for the Metropolitan job.

For the Oklahoma Turnpike Authority, W. D. Hoback was chief engineer-manager, and F. E. Hathaway, construction engineer. M. C. Brady was the resident engineer for Fell & Wheeler. Supervising operations for Metropolitan Construction Co. was Henry Johnson. THE END

Pa. Highways appoints

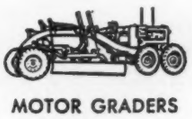
Henry D. Harral has been appointed chief deputy secretary of the Pennsylvania Department of Highways. Harral, a civil engineer, has been supervisor of municipal assistance in the Institute of Local and State Government, University of Pennsylvania, for the past 11 years. The University has granted him a leave of absence to accept the highway assignment.

HUBER-WARCO
motor graders

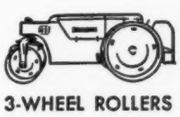
bank sloping made easy

Exclusive with Huber-Warco MOTOR GRADERS is the complete hydraulic cab-controlled blade movement. In less than a minute, and without ever leaving the cab, the operator can move the blade from a 90° bank sloping position on one side to 90° on the other. There are NO manual adjustments to be made. This bonus feature is on all Huber-Warco torque converter and standard transmission MOTOR GRADERS ranging in horsepower from 75 to 195 h.p. Get all the important facts . . . contact your Huber-Warco distributor today.

MAINTAINER


MOTOR GRADERS

TANDEM ROLLERS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HUBER W WARCO

Highway Research Board holds 37th annual meeting

Over 200 papers and reports are presented at 4-day gathering; development of improved methods is theme of discussions

A total of 2,027 highway research engineers and administrators gathered in Washington, D. C., from January 7 to 10 to attend the 37th annual meeting of the Highway Research Board at the Sheraton-Park Hotel. During the 45 separate sessions, extending over the morning, afternoon and evening hours, some 220 research papers and technical reports were presented and discussed. They covered various aspects of highway construction, maintenance, and management in the particular fields of materials, soils, design, traffic, economics, finance, and administration.

At the opening general session, two awards were presented for outstanding accomplishment in the field of highway research. Edward H. Holmes, assistant commissioner of the U. S. Bureau of Public Roads, Washington, D. C., was the winner of the Roy W. Crum Award as a result of his contribution to the development of the field of traffic operations, and for his leadership in the research program of the Bureau of Public Roads. A native of Massachusetts, Holmes joined the BPR in 1928, and his entire professional career has been with this organization in the field of research and planning.

Joint winners of the Highway Research Board Award, for the outstanding paper presented at the 36th annual HRB meeting in January 1957, were George M. Webb and Karl Moskowitz who, respectively, are traffic engineer and assistant traffic engineer to the California Division of Highways, Sacramento. Their winning paper was a joint study of the capacity of California freeways.

HRB chairman Rex M. Whitton, chief engineer of the Missouri State Highway Department, reported to the opening general session on the progress of the AASHO Road Test at Ottawa, Illinois. This is the third in a series of road tests supervised by the Highway Research Board, and it is sponsored by the American Association of State Highway Officials. Chairman Whitton stated that the test facility will be completed during the 1958 construction season so that tests can be started during the latter part of the year. The project, which is eight miles long, will cost over $21 million. The primary purpose of the test is the study of the behavior of pavements of known thickness under moving loads of predetermined magnitude and frequency.

William A. Bugge, Director, Washington State Highway Commission, addressed the meeting on "The Role of Public Relations in the Over-All Planning of the Highway System". Bugge urged the highway officials to recognize the power of the press, and to answer its representatives frankly and truthfully, since the press can help them to put their story across to the public.

Boring and Duhl

The general session also heard an address by M. M. Boring, chairman, Advisory Board on Education, National Academy of Sciences, on "The Technical Manpower Problem". Bor-

Why a TD-24 'dozes full blades *where other rigs spin and*

You don't have to jockey around, or settle for "shirt-tail" loads, or get only part-capacity performance, when you concentrate the International TD-24's full rock-slamming power—right where you want it!

You don't waste time, and fuel, and tractor life with rear-end "sluing." You don't have to "paw dirt" and then wind-up "nibbling," instead of blading out full bites. You don't lose momentum and let the blade lose part of the load every time you steer. Not with TD-24 "follow-through"!

Exclusive International Planet Power steering makes the big difference.

"Dead-track drag" is eliminated

You don't "half-kill" your power and traction to guide the TD-24, as you must with any king-size steering clutch tractor. Instead, Planet Power steering gives you full-time "live" power on both tracks while turning—or while "equalizing" to steer accurately with offset loads. And the TD-24 handles the same big loads on turns or straightaways!

Besides, the TD-24 gives you cycle-speeding, on-the-go Hi-Lo shifting. You adjust speed to the load without stopping, going forward or in reverse. You speed up the shuttle-dozing cycle, take full-time advantage of the TD-24's full capacity!

The fingers of one hand control these TD-24 performance exclusives!

Watch a TD-24 perform—see why rock-movers call it the "rock-dozing special." Visualize how this load-control and bonus capacity make the TD-24 the ideal pusher, or outstanding for non-stop, big scraper pulling! See your International Construction Equipment Distributor for a demonstration.

ing has served General Electric Co. more than 30 years in recruiting personnel, and is considered the dean of the nation's talent scouts. In discussing the awarding of scholarships to college students, Boring expressed reservations about outright grants of money. He cited instances in which young men had accepted funds for education, and had then spent the money for such extraneous purposes as the purchase of a sports car, and to finance a trip to Europe for the student and his wife.

Another opening-day paper was presented at an Urban Research session by Leonard J. Duhl, National Institute of Mental Health, Washington, D. C. Dr. Duhl spoke on "Physical Environment and Mental Health", and stated that controversies about location of major highway projects can lead to a community crisis. As an example, the government psychiatrist cited a small town outside Boston through which the state planned to run a limited access superhighway. According to Dr. Duhl, the prospects of having their town cut in two so upset the residents that community tensions developed, and the juvenile deliquency rate started to climb. After hearing the local protests, the state switched the route to bypass the town. Tranquility was then restored, the psychiatrist explained, and juvenile delinquency returned to normal.

Films featured

The fare of technical papers was lightened somewhat by the showing of three sound movies during the four-day meeting. In advance of public viewing, the U. S. Steel Corp. presented its film, "Jonah and the Highway", which concerns a highway engineer and his job. The moving picture was made to serve the purpose of (a) encouraging young men to enter the highway profession and (b) demonstrating to the public the importance of the Federal Highway Program, and the key role played in it by the highway engineer.

As part of a Maintenance session, the HRB Special Committee on Highway Equipment showed a movie prepared by the Bureau of Public Roads on "Power Shovel Productivity". The film highlighted many job conditions which determine the yardage output of power shovels on highway grading jobs. It also illustrated various trouble spots, and how production is affected by (a) speed of the dipper cycle, (b) size of the dipper load, and (c) frequency and duration of minor delays. This film is available on request to the BPR in Washington.

The Dow Chemical Co. presented the film, "Highway Hearing", which was produced to help in the task of building better understanding for the Federal Interstate Highway Program; also to assist in getting the public support highway officials must have at public hearings required by this program. THE END

National Safety Council reviews crane accidents

A recent data sheet prepared by the National Safety Council, entitled "Crawler, Truck and Similar Cranes", shows where and how most crane accidents occur. It reports that the most dangerous area, near a load, accounts for 41 per cent of all injuries; unsafe practices by operators, and operating too near obstructions and stationary equipment—12 per cent; and violations of safe practices in fueling, checking water, and other maintenance work—11 per cent.

Also contributing to crane accidents are the failure of defective booms, cables, and sheaves; jumping off or climbing on cranes without using hand-holds; and working or standing in the line of swing of a crane cab or boom. One of the chief crane operating hazards is contact with power lines.

The analysis indicates that three basic rules should be observed: make regular and thorough inspections of hooks, slings, cables, booms, and other vital parts, and keep them in safe condition; train workers in safe practices; and require the workmen to observe such practices.

I-H elects Schumacher

W. C. Schumacher has been elected executive vice president and a member of the board of International Harvester Co., Chicago, Ill.

A 41-year veteran of the firm, he served as sales manager in 1944 for the newly formed Motor Truck Division, and two years later was named the division's general manager. In 1953 he was elected vice president and continued as executive head of the Motor Truck Division.

←For more facts, circle No. 221

Put one track in high range, the other in low—and the TD-24 pushes straight ahead, despite the tremendous offset load of benching-out unshot rock strata. P. C. Cooper, Blountsville, Tennessee, first rented this TD-24—then bought it because of its rock-'dozing performance!

An 8-unit TD-24 fleet owned by Rusciano and Sons Corp., replaced 8 big competitive crawlers—because TD-24 performance "measured up" to the toughness of this big road job. There was a considerable tonnage of granite and other rock to bulldoze—on the White Plains (N.Y.) Section of the 'Cross Westchester Expressway!

"With the TD-24, I can outwork any other machine where you have to push and turn with a big load," declares Operator Dan Olmstead, for Gibbons & Reed, Salt Lake City, Utah. "The TD-24 keeps the load moving, because you don't lose power braking a track." The TD-24 is spreading rock on a tough million-yard project—widening U. S. 40 in the Truckee River canyon near Reno.

International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

Aggregates go from the hopper to the cold-bucket elevator feeding the 28-foot-long dryer of the Cedarapids plant. Trailer-tankers of 5,000-gallon capacity, right, serve as fuel-oil tanks.

Asphalt plant on wheels cuts set-up time

A number of modifications over a number of years by the contractor made a Cedarapids Model E asphalt plant completely portable and capable of being dismantled and shipped to a new location in as little as three days—depending on the distance to the new plant location.

This plant was used recently by Duval Engineering & Contracting Co., Jacksonville, Fla., to turn out the 30,000 tons of asphaltic concrete needed for the 11½-mile, four-lane surfacing of U. S. 1 north of Bunnell, Fla.

The highly maneuverable plant, with a capacity of 120 tons per hour, has most of its components mounted on wheels. Such items as the asphalt storage tank, fuel tanks, generators, feeders, transformers, and dust collectors are wheel-mounted so that they can be hitched to trucks and towed along the highways rather than loaded onto trailers for transport.

Other time-savers when moves are required are the collapsible hinged sides of the contractor-built aggregate bin. These make it possible for the unit to be quickly dismantled, loaded on a truck-trailer and hauled to the new plant location.

Excluding the asphalt line between the storage tank and pugmill, all pipelines have been replaced by high-pressure rubber hoses. This feature alone does away with the time-consuming process of removing the many coupling connections and lifting the pipe sections onto trucks. Only one end of a rubber hose connection needs to be removed; the hose itself remains attached to its component.

The modified Cedarapids Model E plant has its aggregate stockpile maintained by a Hough Payloader with 1-yard bucket. A Lorain crane charges the aggregate hopper.

DOES DT CAST A SHADOW OVER YOUR SPREAD?

Rx Prescription Filtration

There's a specific WIX Cartridge engineered for every engine in construction service . . . gas or Diesel—mobile or stationary—for fuel or lube oils.

CATERPILLAR
INTERNATIONAL
ALLIS CHALMERS
DETROIT DIESEL
LE TOURNEAU
EUCLID
MURPHY
and ALL OTHER Construction Equipment!

It's Down Time that Costs You Money!

Abrasive grit and dirt creeping into your motor oil is a major cause of engine failures that sideline your equipment; but WIX Filter Cartridges keep oil *clean* all the time!—don't give these contaminants a chance to get in their dirty work. You can't afford "time-out" for equipment down time!

Install WIX Cartridges in all your engines and keep your equipment on the job, on time, building your profits! WIX will make a FREE Filter Survey for you listing all your engines and showing the correct lube and oil filter replacements. Also, deliver a reserve supply of these Cartridges to your local WIX Wholesaler. One near-by source of supply for prompt, COMPLETE Oil Filter Service—no heavy inventory for you! Ask your Jobber, or write us direct, TODAY!

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OIL FILTERS AIR FILTERS
AUTOMOTIVE • INDUSTRIAL • RAILROAD
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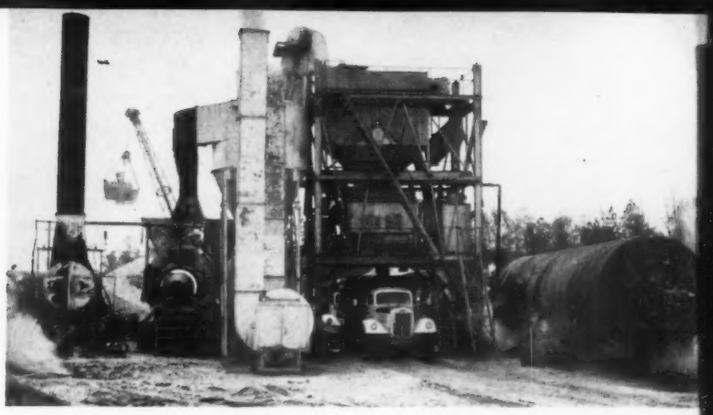
OIL FILTER SURVEY
. . . lists correct WIX replacement Cartridges for every engine; plus Inventory Control Record.

FLEET MANUAL
. . . for a continuing record of every engine. Maintenance, repair, performance—at-a-glance.

For more facts, use Request Card at page 18 and circle No. 222

Wheel-mounted plant components eliminate need for loading job; rubber hoses, replacing pipelines, made integral part of units



A batch of asphaltic concrete is dumped into a White 16-ton truck for the paving of U. S. 1. Such items as the asphalt storage tank, fuel tanks, generators, feeders, dust collectors and transformers are wheel-mounted for towing along the highway.

Pumps also attached

The various pumps of the plant—such as the asphalt and steam pumps—are mounted and hooked in position on the storage tank and boiler. They never have to be dismantled and removable lines are never needed between these pumps and the boiler. When the plant is dismantled for a move, the pumps remain attached to the plant components and are transported as an integral part of each.

Two 5,000-gallon storage tanks for the Bunker C fuel oil consist of a trailer-tanker and a wheel-mounted tank. Another 5,000-gallon tank stores No. 2 diesel fuel for various equipment on a project. This tank, like the fuel-oil tanks, is equipped with its own pump.

A large truck-trailer houses electric-power equipment, doing away with the need for dismantling these units and loading them onto trucks for a move. In the truck-trailer is a GMC 268A diesel engine driving an Allis-Chalmers alternator, which supplies power to run the plant. It also houses a Caterpillar D311 generating unit which supplies power for lights and the fuel pump of the steam boiler.

All these modifications were added and improved upon as the plant was being used during the last few years. And the contractor plans to incorporate many of the field-tested and time-saving features in any plants he purchases in the future.

Plant operation

The modifications have not affected the productiveness of the plant. Typical of its operations was the work on the U. S. 1 surfacing job.

Aggregates, consisting of crushed lime rock and sand, were delivered directly to the plant by rail cars that used a plant spur. A Manitowoc crane used a 1¼-yard clamshell bucket to unload the cars and form two stockpiles adjacent to the contractor-built aggregate bin. A Lorain crane with a 1¼-yard rehandling bucket charged the two-compartment, 150-ton aggregate bin from one location as two Hough Payloaders maintained the stockpiles.

The bin was equipped with a Syntron vibrating feeder which discharged the aggregate to a cold-bucket elevator feeding the dryer. The dryer, measuring 88 inches in diameter and 28 feet in length, was fired by two Houck high-pressure burners using Bunker C No. 6 diesel fuel.

Leaving the dryers, the heated ag-

(*Continued on next page*)

Doing as much as three power shovels and a dragline, this TD-18 4-In-1 dug up, and loaded, up to 1,700 feet of old concrete pavement daily—for Henry E. Berghuis, Prinsberg, Minnesota. Famous pry-action break-out makes the big difference over other rigs!

Don't let a single-action loader hold you up... see how a 4-in-1 multiplies your profit-range by four!

You've got a gun in your back two ways—with an old-style, single-action "dip-and-dump" tractor loader!

It holds you up on price, by giving you only the one machine action for your money. It hijacks profits, by sharply limiting job range and capacity.

Now, see what a contrast, in multiplied value and earning power, an International Drott 4-In-1 offers!

4-machine utility — one-machine price!

An International Drott 4-In-1 gives you four built-in, multiple-duty, big-capacity machine actions, for only a one-machine price. Your fingertip command, through the "machine-selector" lever, instantly puts any 4-In-1 action you need at your service.

Skid-Shovel action gives you exclusive, "concrete-smashing" pry-action break-out—with famous bucket-heaping, ground-level roll-back. "Carry-type scraper" is your accurate grading, stripping, spreading, or compacting action. Clamshell action provides one-gulp "stand-and-fill" ability, plus hopper-high, self-cleanout, bottom-dumping. Bulldozer action delivers aggressive, big-yardage, earth-rolling ability.

Ease into the foam-cushioned seat—prove that your 4-In-1 investment will multiply your job-taking, money-making ability. And compare the performance protection of exclusive shock-swallowing Hydro-Spring to unprotected hose-bursting, machine-mauling "lunge-and-lift" design. Ask your International Drott Distributor to demonstrate the top buy, by far, in the construction machinery world: the 4-In-1 size that fits your needs!

Bulldozer... with clam lip up and shoes on the ground, it's a big-yardage, earth-rolling blade!

"Carry-type scraper"... that grades, strips, or spreads with inch-close accuracy.

Skid-Shovel... with Drott's exclusive pry-over-shoe break-out and ground-level roll-back.

Clamshell... that fills itself in one fast gulp — gives you hopper-high, self-clean-out dumping.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

For more facts, use Request Card at page 18 and circle No. 223

On the highway, a Blaw-Knox rubber-tire paver has its hopper filled with hot-mix by a White batch truck.

As the B-K paver lays the 1½-inch binder course along the inside lane, the hot material is compacted by a Galion 10-ton tandem roller.

(*Continued from preceding page*)

gregate was picked up by the hot bucket elevator, which dumped the material onto the Symons double-deck vibrating screens atop the batch plant's aggregate hopper.

The top deck consisted of screens having openings of ¼ inch and 1¼ inch, while the bottom deck had No. 10 openings. The screens, used to separate the stone and sand into the bin's two compartments, were so positioned that the ¼-inch screen prevented the larger size stone from falling directly onto the No. 10 sand screen.

Heated Texaco asphalt, with a penetration of 85 to 100, was delivered to the 20,000-gallon horizontal storage tank by 5,000-gallon tank trailers pulled by Mack tractors. The asphalt in the tank was kept heated to 320 degrees F by a locomotive-type, 150-hp, oil-fired steam boiler. Water supplied by two wellpoints, 65 feet deep, was pumped to the boiler by gasoline-driven pumps.

The charging of stone, sand, and asphalt into the plant's pugmill was done manually after each ingredient had been weighed on a Yale & Towne scale. Making up a 4,000-pound batch of binder course, which used the 1¼-inch stone, were 208 pounds of 85 to 100-penetration asphalt, 758 pounds of sand, and 3,034 pounds of stone. During the production of the 1-inch-thick wearing surface material, ⅜-inch stone was used instead of the 1¼-inch material.

Use two finishers

Hauling the asphaltic concrete from the plant to the finishing machines were six White 16-ton batch trucks. When paving operations started, Duval used two finishers—a Blaw-Knox rubber-tire paver and a Barber-Greene—to place the 1½-inch-thick binder course over the lime rock base. Before the 12-foot widths of binder course were placed, the base was primed by a Littleford pressure distributor.

Each finisher had a separate crew at the start. The Blaw-Knox rig placed the inside lane and the Barber-Greene, following 1,000 feet behind, placed the binder course for the outside lane. The maneuverable Blaw-Knox paver was used along the 12-foot inside lane to catch the paved crossovers between the existing and new roadways. Compaction was han-

Fast flow for low slump concrete — as many "chutes" as need demands —

SMITH sets the pace for new roadbuilding

Smith "concrete factories on wheels" *help push a turnpike across Nebraska*

Here is tomorrow's business today . . . as the network of America's super highways spreads across the nation under the spur of the federal roadbuilding program.

Smith "concrete factories on wheels" put speed into this gargantuan paving job . . . provide as many fast discharging "chutes" along the line as work schedules and available finishing crews demand . . . end the need for depending on the yard by yard output of a paver.

Smith's multi-speed transmission and patented T-shaped blades give absolute control over the mix . . . *double mix* all materials in true flow action to produce high quality "inspection type" concrete needed on tomorrow's jobs.

To put (paving) speed into turnpikes . . . profit-wise contractors look to the Smith equipped ready-mix operator . . . the man equipped to handle tomorrow's roadbuilding business today!

LOW MAINTENANCE COST
Manten steel drums and blades
BIGGER PAYLOADS
Better weight distribution puts more weight forward
CHOICE OF SIZES
4 yd thru 9 yd
(12½ yd agitator)
PTO or separate engine drive

Since 1900, the pioneer designer and foremost manufacturer of the world's finest mixers.

THE T. L. SMITH COMPANY • Milwaukee 1, Wisconsin • Lufkin, Texas

affiliated with Essick Manufacturing Company, Los Angeles, California.

For more facts, use Request Card at page 18 and circle No. 224

dled by two Galion 10-ton tandem rollers.

After paving operations were well under way, Duval used only one crew with the two finishing machines. The Barber-Greene was used first to place about a mile of pavement along the outside lane; then it was shut down. The crew then went back to the Blaw-Knox finisher and paved the inside lane and crossovers. Before completing the project, Duval placed a binder and wearing course over the existing 24-foot roadway to give the 11½-mile project a uniform appearance for its entire length. The best paving production per 10-hour day was 1,450 tons of asphaltic concrete; the daily average for the job was about 1,100 tons.

Personnel

J. C. Higginbotham was the paving superintendent and George D. Osbourne, the assistant superintendent, for Duval Engineering & Construction Co. E. K. Martin was the resident engineer for the Florida State Road Department. THE END

Fantastic tunneling rig needed by Armed Forces

The Armed Forces are urgently seeking a design for a tunneling rig capable of boring through soil at a rate of 6,000 feet per hour. The machine needed should be able to eat its way through rock at 2,000 feet per hour without creating a major waste-disposal problem.

This mechanical mole is one of 387 units described in "Inventions Wanted by the Armed Forces", published by the National Inventors Council in cooperation with the Army, Navy, and Air Force.

Other inventions needed for construction include a high-speed track for earthmoving equipment that will have a life expectancy of 5,000 miles of operation at 25 mph, and 20,000 miles at 5 mph.

Expendable construction machinery—inexpensive enough to be left behind or destroyed at the construction site—is also needed. These rigs will be used by engineers in areas where only the men can be removed after a construction job is completed.

Lightweight earthmoving equipment, light enough to fly into a construction area, yet heavy enough to do a big earthmoving job, is also on the list. Big-job earthmoving machinery now in use utilizes great weight and horsepower to do its tasks. The needed lightweight machinery being sought may have to utilize a new principle of earthmoving. Perhaps extra weight can be added to the machinery after it reaches its destination.

A trail-marking device or system is also wanted for the Arctic. It should be simple in design.

Copies of "Inventions Wanted" may be obtained by writing the National Inventors Council, U. S. Department of Commerce, Washington 25, D. C. Suggested solutions to problems also should be addressed to NIC, the government's official clearinghouse for processes and inventions of potential value to the Armed Forces.

For more facts, circle No. 225→

I-H to handle rigs made by Cone, Wagner

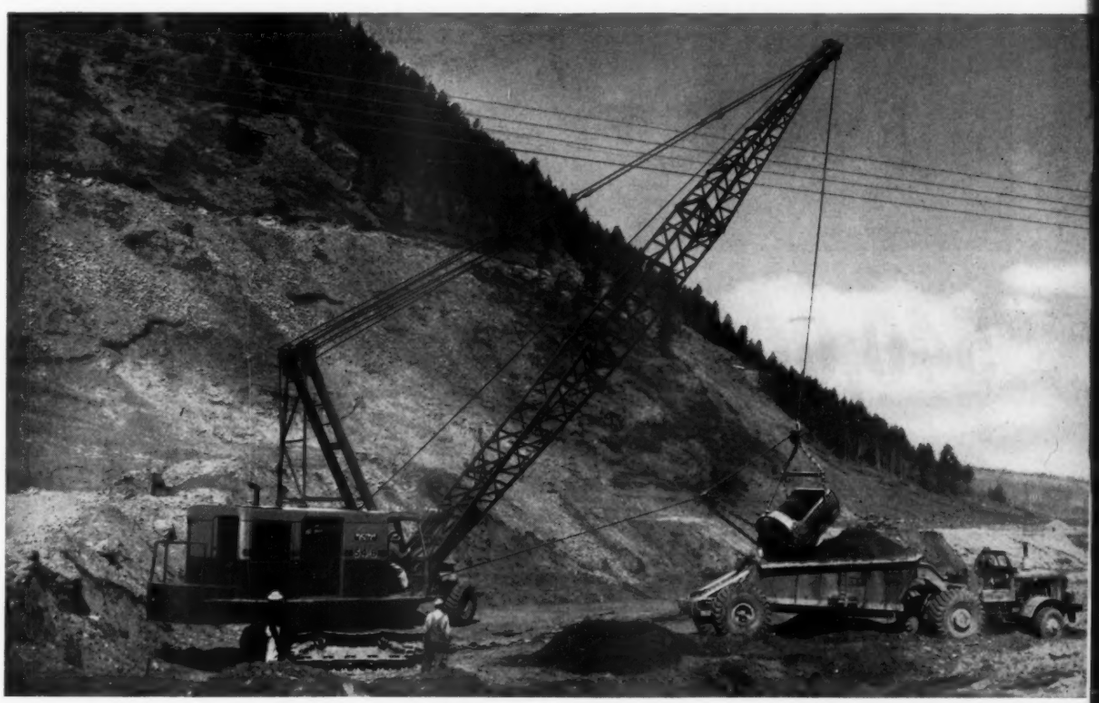
International Harvester Co., Chicago, Ill., is buying equipment from Cone Automatic Machine Co., Windsor, Vt., and Wagner Iron Works, Milwaukee, Wis., that will be resold to dealers and company-owned retail outlets. The purchases are being made under agreements between I-H and the two firms. The backhoes and commercial heavy-duty front-end loaders made by the Wagner and Cone organizations will be offered for use with the I-H utility-type wheel tractors so that tractors and mounted equipment can be purchased as a complete unit.

The firm will distribute and sell these products under the name of I-H Pippin and I-H Wagner.

"Doesn't know the meaning of the word fear—"

On BIG yardage jobs---or small

Bonus Quality means Bonus Production



Working at elevations up to 6,000 feet, a Bucyrus-Erie 54-B dragline keeps hauling units busy during construction of the earthfill Palisades Dam on the Snake River near Irwin, Idaho, for U.S. Bureau of Reclamation.

World-wide preference for Bucyrus-Erie draglines is based on outstanding performance — year after year, on big jobs and small.

Bucyrus-Erie's reputation for staying on the job and getting more done is simply the direct result of close attention to quality in manufacturing. Steels that go into each machine are triple-tested to insure that they meet highest standards. Hammer forging, annealing, case hardening, flame hardening and stress relieving processes are applied — each where it contributes most to strength, toughness and hardness.

Bucyrus-Erie gives you top quality in design, too. Balanced digging cycles mean consistently high output every shift . . . conveniently-grouped, easy controls save time by cutting waste motion, increase production by reducing operator fatigue . . . simple adjustments and accessibility speed maintenance.

See your Bucyrus-Erie distributor today for complete information on draglines and shovels from ⅜- to 4-cu. yd. capacity. For data on larger machines, write direct to Bucyrus-Erie. 322E57C

Bucyrus-Erie Company
South Milwaukee, Wisconsin

BUCYRUS ERIE

Bonus Quality is the result of extra care in Bucyrus-Erie manufacturing. Here the carefully controlled flame-hardening of the lower path for the hook rollers insures long life and low maintenance of this component.

540,000 gallons of water used daily by sand and gravel plant!

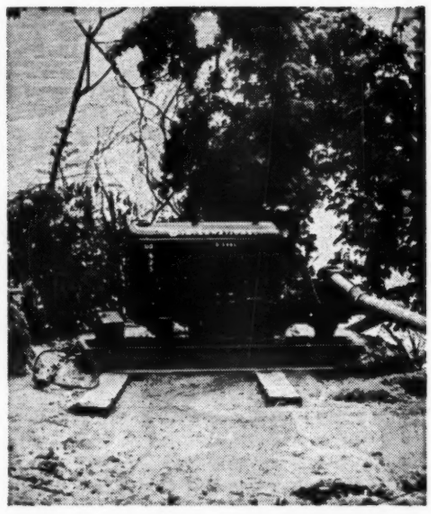
MARLOW supplies water to meet full requirements

To supply water for their Pioneer and Simplicity washing and screening plant, the Nello L. Teer Company, Erwin, N. C., uses a Marlow 6G3S pump powered by an International-Harvester engine. The pump, located on the bank of a river, carries the water up a steep hill to the plant, a half mile away. On continuous operation, the pump delivers 54,000 gallons per hour, but *can* handle up to 66,000 gallons per hour during peak periods!

Fred Byrd, Superintendent of Operations for the Teer Company, said that the plant has a capacity of 1,400 tons per 10 hour day and uses 540,000 gallons of water. The plant produces sand and gravel up to 1¼ inches in diameter and is used on their own construction jobs as well as sold commercially to other construction firms. Serving the washing and screening plant is an Eagle Screw, Barber Green Conveyor Belts and a Telsmith Gravel Crusher.

Mr. Byrd is well pleased with the performance of his Marlow pump. He says it runs 10 hours a day without interruptions and gives him all the water he needs to meet his requirements.

Let Marlow help you solve your pumping problem. Write today for information on the complete line of A.G.C. rated pumps and famous Marlow Mud Hogs for handling muddy and trash-laden water. Ask for Bulletin CO-4 and the name of your nearest Marlow dealer.



Marlow PUMPS ®

DIVISION OF

BELL & GOSSETT CO.

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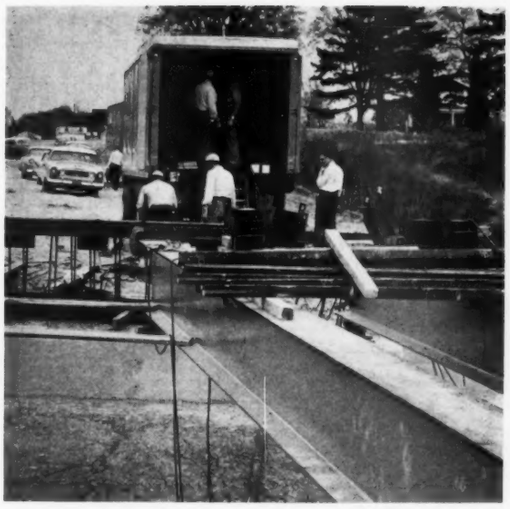
For more facts, use Request Card at page 18 and circle No. 226



The semi-trailer carrying eight Hobart motor-generator welders backs right up to the new highway bridge being built over the Black River near La Porte, Ohio, so that cables can be strung out for welding crews working on the span.

Eight welders transported in one low-cost operation

A semi-trailer, outfitted with eight welders, is making it possible for Don R. Fruchey, Inc., bridge-welding and steel-erecting contractor of Fort Wayne, Ind., to erect steel for bridges in good time and at a low cost.

Eight Hobart 300-amp motor-generator welders, located at the rear of the trailer on welded angle-iron racks, are powered by a 125-kw General Electric ac generator, driven by an 8-cylinder diesel engine converted to use liquid petroleum gas. Eight welding operators can string out cables from the trailer and go to work at once. One man services the power unit and adjusts the welding current on each welder, at a signal from the operator. Propane gas stored in special tanks on the sides of the trailer is piped to the engine.

Operation Snow Removal in high gear on turnpike

Operation Snow Removal is keeping the New Jersey Turnpike open to traffic during this winter season. Snow-removal equipment, weather forecasting services, radios, and signs on road conditions are all working together to speed clearing operations and aid motorists.

The Turnpike Authority's weather services include reports from the U. S. Weather Bureau, a private service, and the meteorological services of nearby airports. Various maintenance divisions are alerted by radio about adverse weather, and equipment for handling snow removal and other maintenance operations can be called out immediately.

Large signs at toll booths inform motorists of fog, snow, ice, or sleet and caution them to drive slowly. If conditions warrant it, the speed limit is reduced to 35 miles per hour and this is posted on the turnpike.

Film shows use of steel in concrete structures

A 16-mm sound, color film, released by Bethlehem Steel Corp., Bethlehem, Pa., covers the theory and use of steel reinforcing bars in concrete structures.

"Steel in Concrete," timed at 38 minutes, shows the effects of stress and strain upon un-reinforced structures, and methods that are used to regulate the characteristics of new billet reinforcing steel. Also discussed are the problems of crack control; bond and anchorage, which enables steel and concrete to act together as a unit; and deductability, which determines the ability of new billet steel reinforcing bars to be bent safely in accordance with ASTM recommended procedures.

This technical film is available for group showings by writing to Modern Talking Picture Service, 3 East 54th Street, New York 22, N. Y.

Text covers problems of industrial architecture

"Building for Industry", a 309-page authoritative study of contemporary architecture, has been published by F. W. Dodge Corp. Chapters present problems and solutions of building design, and discuss material handling, color, electrical systems, air-conditioning, and lighting.

The book analyzes industrial architecture under six categories: warehouses, consumer goods, manufacturing laboratories, utilities and service industries, and heavy and light industries.

Priced at $9.75, the book can be purchased from the F. W. Dodge Corp., 119 W. 40th St., New York, N. Y.

(Advertisement)

Slow Pay for Contractors makes roads cost more!

In a recent issue of the Washington News Letter, Duane L. Cronk, "Roads and Streets" Washington Editor, reports:

Credit needs of the highway industry to meet the expanded road-building program have just been released by the American Road Builders Association. ARBA believes that, in spite of the tight money situation, highway construction will not be deterred.

The ability of contractors to bid on work is markedly affected, however, ARBA declares, by their supply of working capital. The implication is that if a state highway department wants the most contractors possible bidding on future jobs, it should do what it can to make it financially possible for them to do so. That means retaining less money and making quicker payments for work completed. Here are some practices ARBA would like to see highway officials adopt to bring money earned by contractors into their pockets faster:

Reduce present 10% ordinarily retained on contract work to maximum of 10% retained only on first 50% of work performed under contract.

Assign enough men within the department to processing of contractor's estimates to assure prompt payments.

Reduce the regular estimate payment interval from one month to two weeks.

Schedule lettings to avoid overloading contractor capacity in any period, and plan them at least six months to a year in advance.

Pay for materials delivered to job site to fullest extent possible.

Make progress payment on basis of plan qualities, rather than waiting for detailed computing of estimates. Compute final estimates only.

Contractors make only about 2% profit after taxes, according to ARBA's special Task Force Report. Another 2% of the contract dollar must be set aside by contractors in the higher income brackets for incomes taxes. This leaves 96% of the contract dollar — 20% for equipment, 35% payrolls, 41% materials and overhead — for all of which the contractor must obtain financing. The National Highway Association foresees that as the National Highway Program picks up speed, the ability of the contractors to take on as much work as they could easily handle on the job, would be limited by their financial resources.

This is a particularly pertinent problem because of prequalification (only 10 highway departments do not prequalify) by which a state insists on the financial ability of low bidder to swing a project before awarding him the contract. Bonding companies, too, scrutinize a contractor's fluid assets closely before approving him for the required bonds.

ARBA believes that two obvious ways to keep contractor credit fluid would be to liberalize the retainage practices followed by the state highways departments, and speed up payments for work completed. They say:

"We estimate that, if a state retains 10% of the contractor's earnings on a $500,000 job, it ties up a total of $50,000 of his money or an average of $25,000 through the life of the contract. If partial payments are delayed, as they frequently are, by even as much as two weeks, another $20,000 of the contractor's earnings are frozen during the life of the contract."

QED . . . Contractors must include these financing costs in their bids . . . they are forced to delay bidding (or starts) on new highway jobs until final settlement is received for previous jobs. Both of these end results create higher costs and slower progress on urgently needed-now highways.

1808-DC-1

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Riveting vs. bolting method

Faster work, savings in man-hours and money on boiler structure cause owner to switch to bolting for subsequent construction

Steel erection for the boiler installation at the Smithers Lake Steam Electric Station of Houston Lighting & Power Co., in Texas, required 20,633 high-tensile bolts.

Cost comparisons of bolting and riveting are always difficult, since each job has many variables that affect the price of the work.

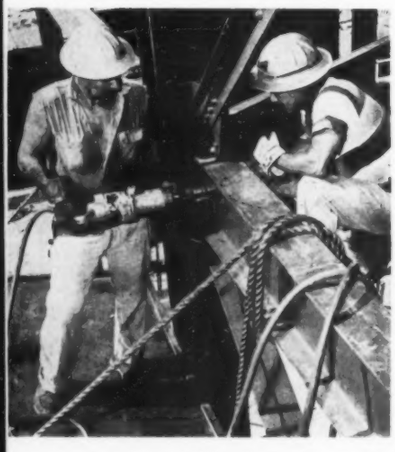
An ideal situation for cost comparison is to have two identical structures, one of riveted, the other of bolted construction.

This ideal situation actually cropped up recently, giving Ebasco Services, Inc., New York City, a chance to make a closely controlled comparison of the bolting and riveting techniques.

Riveting was being used on a new boiler structure for a 165,000-kw unit at the Sam Bertron Steam Electric Station of Houston Lighting & Power Co. in Texas. Work on this station had been under way several months, when the power company was ready to start work on an identical installation, the Smithers Lake Steam Electric Station. Ebasco Services, Inc., handling the engineering and construction, recommended that bolts be used for the newer station. Then, with work under way, Ebasco was able to keep close tabs on costs and labor time on both jobs.

Both stations have Combustion Engineering, Inc., steam generators, and the supporting steel for the generators at each station required 20,633 field fasteners.

On the Smithers Lake boiler struc-



A two-man bolting team, using an Ingersoll-Rand Model 5340T torque control impact wrench, makes an average of 177 connections daily. Wrenches are checked twice daily for proper torque.

Pouring concrete in strips 12 feet wide on a new expressway, Koehring 34-E *twinbatch* paver averaged 1100 feet per 8-hour day. 10-inch slab consisted of 8-inch mesh-reinforced base, 2-inch top course.

PLAN YOUR SPREAD FOR

the heavy paving program ahead

Long-range outlook on the extensive road program, and new "jet-age" airbases, indicates a steadily-rising curve of construction activity in all areas. It also indicates plenty of paving business ahead for the contractor who is in a position to compete favorably in the bidding, and who can profitably complete contracts *on schedule.*

In planning your equipment spread, you can't afford to gamble on the production end of your job — *at the paver,* where every second counts. That's where the *reserve* production capacity of a Koehring 34-E *twinbatch*® protects your schedules and profits. It hits a top output of 86.7 batches an hour, on 60-second mixing cycle. This lets you pick up any lost time, when you need it, to offset normal job and material delays — maintain a high *average* speed throughout duration of the job — keep batch plant, trucks and finishers working at peak efficiency. With *twinbatch* Autocycle control, every mixing operation is automatic, accurate, and fast. Drum charging, mixing, transfer and discharge are all synchronized by Koehring Batchmeter, a simple timing device. 8-second skip-hoist speeds charging. Big, double-door bucket and wide-swinging boom speed concrete distribution on the grade. What's more, accessibility of every paver maintenance point, plus heavy-duty construction, all help to keep paving jobs rolling *on schedule.*

You'll find there's no substitute for the steady output, speed and economy you can get with 34-E *twinbatch* pavers on your big-production highway and airport contracts. Talk it over with your Koehring distributor. He has more information that will interest you. Why not call him *today?*

hodcompared on identical units

by L. W. DONNELLY, construction manager
Ebasco Services, Inc., New York, N. Y.

ture, Ebasco used three pneumatic wrenches to install the Russell, Burdsall, & Ward high-tensile bolts, and a mechanical torque wrench for inspection. The impact wrenches, set slightly above the minimum recommended tightening torque, were checked twice daily with a Skidmore-Wilhelm Model 850M calibrator that checks bolt tension. This close control of calibration helped reduce other inspection requirements.

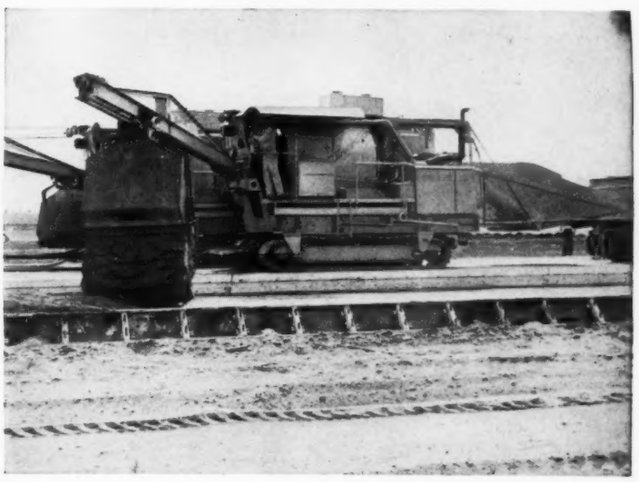
All bolts were inspected for marks that would indicate they had been engaged by the torque wrench. The mechanical torque wrench, Snap-On Model PQ602AL, was used on about three per cent of the bolts to check torque applied by the pneumatic wrenches.

Aside from ease of inspection, a number of factors combined to bring costs down on the bolted structure: joints were set up early; only a few floats and scaffolds were used; and pinning or drifting was minimized.

In figuring out the respective costs of the structures, Ebasco found that one 4-man riveting team at the Sam Bertron Station installed an average of 131 rivets in an 8-hour day, or 4.1 per man-hour, while one 2-man bolting team at the Smither Lake installation averaged 177 bolts per day or 11.1 per man-hour. The total savings in direct labor costs were about $12,000. And after deduction of the additional costs of the bolts, washers, and nuts—about $8,500—net savings came to $3,500. So impressive are the savings that several additional units for Houston Lighting & Power Co. will utilize high-tensile bolts. THE END

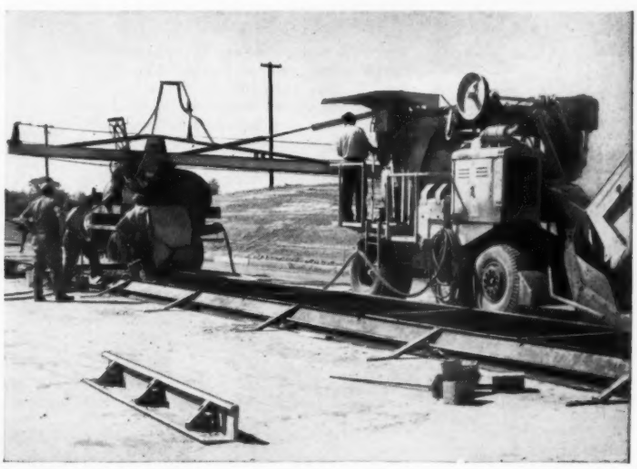
34-E *twinbatch* team works side-by-side on big U. S. airbase

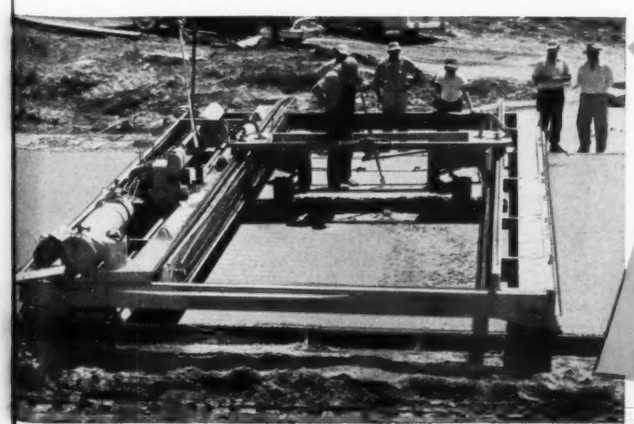
Widening runways on a military airstrip, contractor completed job "on the double" with a pair of big Koehring 34-E *twinbatch* pavers. Notice how one long-boom 34-E poured the outside half, while the other poured the inside half of the strip. For balanced, high rate of production at *both ends* of the job, many contractors team up *twinbatch* pavers with C. S. Johnson automatic batch plants (another Koehring product worth checking). Clamshell cranes, finishers also available in big Koehring paving "package".



Mobile 16-E paves center-strips, intersections, bridge-approaches

On street and highway jobs, there's always extra concrete to be laid in addition to the main slab, such as curbs, gutters, center-strips, scattered intersections, approaches to driveways, bridges and side-roads. Consider the time-saving flexibility you can get with a rubber-tired *twinbatch* in your paving spread. This Koehring 16-E is as mobile as your batch trucks — can get back on the new slab *in as little as 7 days* to do clean-up work, or pave adjoining strips. Also has high elevated discharge, pours into overhead hoppers, forms, chutes. You'll find its usefulness unlimited as a utility unit . . . or as a general-purpose paver.





"Timely" precision-finishing —

is important on every paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete — harsh, wet or dry — produces smooth, mechanically-accurate slab with uniform crown transitions.

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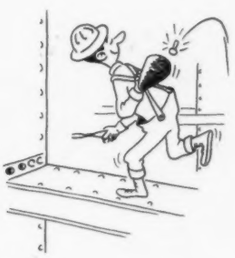
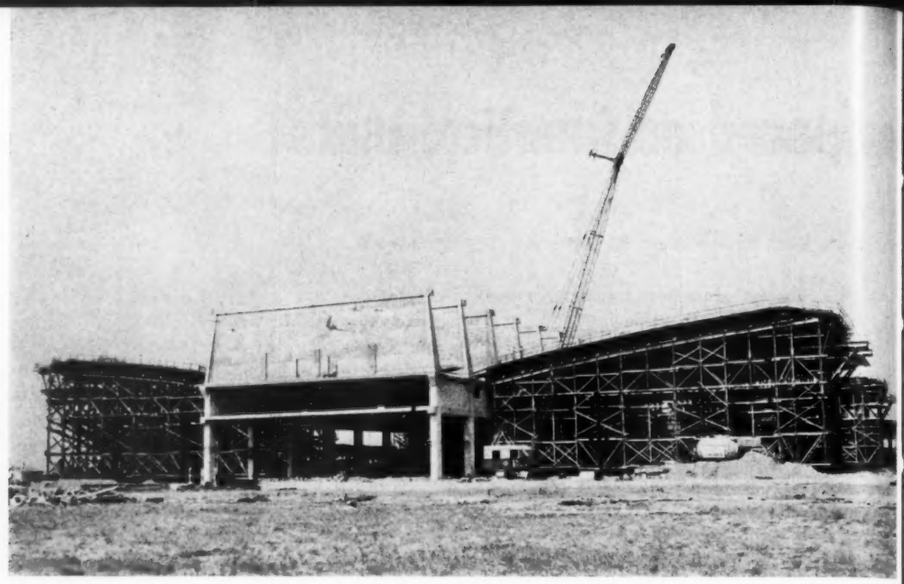


Record 1957 output of structural steel

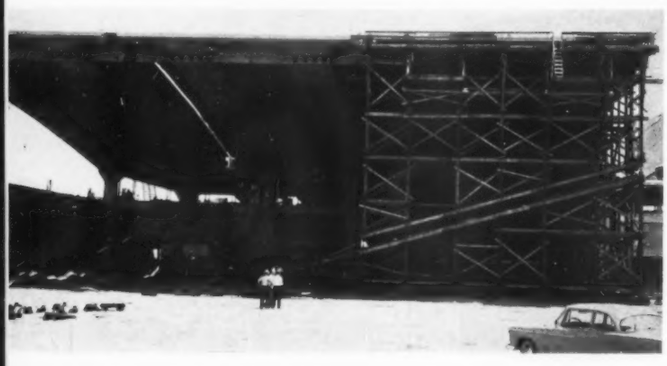
The output of heavy structural shapes from rolling mills came to an estimated 6,700,000 tons in 1957, or 25 per cent above 1956 levels, according to the American Institute of Steel Construction.

This represents an increase of nearly 1½ million tons of structural steel in a little over a year. By 1959, an additional 1 million tons are expected to be available as producing mills expand their facilities.

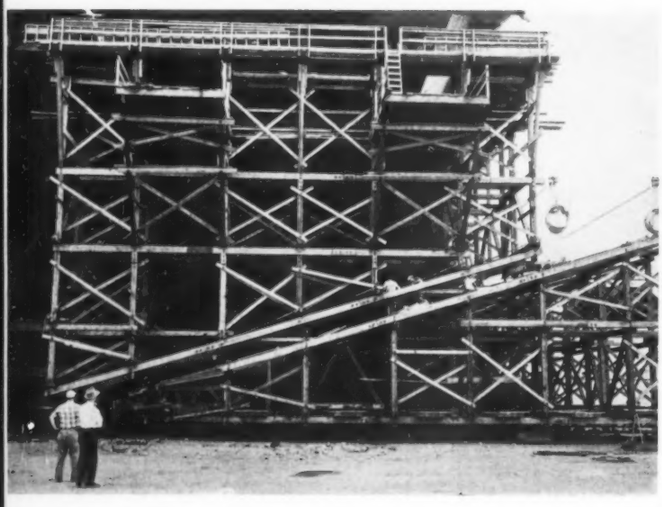
Four travelers are used to construct the cantilevered roof. All work is done simultaneously on opposite sides of the three-story center section. The 30-foot-high anchor walls spanning the 100-foot center section have tie beams cast monolithically to anchor bridge cables supporting the cantilevers.



On completion of a 60×130-foot section of the cantilevered roof of the Pan American World Airways maintenance hangar at New York International Airport, the double-wedge traveler is ready to move. Screw jacks have been removed along the inclined plane and the wooden wedges from under the bottom section. The crane, left, controls the movement of the lower wedge.



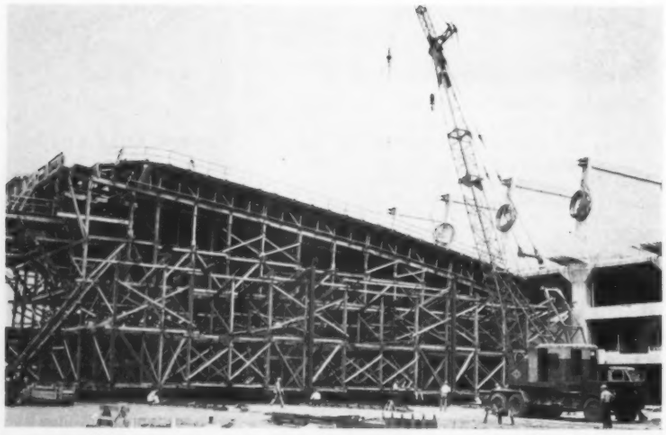
Unique travelers form corrugated cantilevers



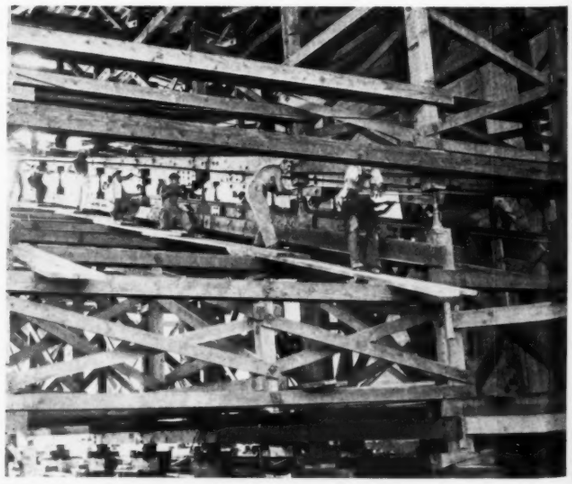
The lower wedge begins moving sideways, riding on four rows of flanged wheels that ride on four rails. As the lower wedge moves, the upper wedge is lowered but kept from moving sideways by two cables attached to deadmen buried in the ground. After being lowered 6 feet to clear the corrugated slab, it is stopped by a wheel lug welded to the rails.

The age-old method of using two movable wedges to raise and lower a weight had another first use during construction of cantilevered hangar roof slabs at New York International Airport.

The building is the $11 million Pan American World Airways maintenance base, which has roof slabs extending 130 feet from each side of the hangar. The wedges used were actually traveling forms, devised and fabricated by Corbetta Construction Co., Inc., New York, N. Y., holder of the $7 million contract for the concrete work. After pouring the cable-supported, post-tensioned, corrugated, cantilevered slab, the contractor gently lowered the upper wedge 6 feet by making use of an inclined plane between the sections.

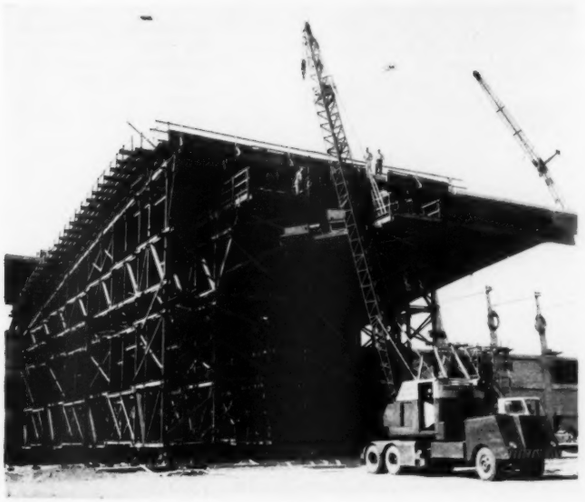


The upper and lower wedges have been locked together, permitting a Bay City truck-crane to pull the entire traveler 60 feet ahead to the next pour position.



Making ready for the next pour, workmen re-install the 56 Simplex screw jacks between posts of the upper and lower wedges.

Huge timber forms, using principle of the double wedge, operate smoothly and have salvage value after job



After the cables have been stressed, the jacking platforms are lowered from the traveler, one at a time, by a Bay City truck-crane. Circular shims behind the socket on the cables maintain the stress applied.

Modern hangar

The new maintenance base consists of a three-story center section, 100 feet wide and 630 feet long, and the two 130-foot-wide cantilevers on each side. The cantilever provides a vertical clearance of 35 feet at its hinge, and rises to a 53-foot clearance at the outer end. The horizontal-hinge arrangement of the hangar doors makes it possible to extend the floor under each cantilever to 140 feet. This gives hangars and center section a total width of 380 feet.

Twenty-two anchor walls, 30 feet high, span the 100-foot center section above the roof. These walls, spaced on 30-foot centers, are topped with monolithically-cast tie beams which anchor the bridge cables supporting the cantilevers. Each of the 100-foot-long tie beams, designed to resist the tensile forces caused by the weight supported by the hangar cables, consists of twenty-four 1⅝-inch-square bars, equally spaced within four vertical rows that run the entire length of the beam. The bar sections were butt-welded by the Thermite welding process to eliminate any possibility of their becoming disconnected after the load was applied. The bars were connected to four 2¼-inch gusset, or anchor, plates. There are two of these plates on each end of the beam, and 6 bars were welded to each face of an anchor plate. All this work was fabricated on the ground while the walls were being formed. It was positioned just before concrete was poured. This done, the wall and tie beams were cast monolithically.

The tie beams allow the two opposing loads supported by the cables to counterbalance themselves. The number of steel bars encased in concrete help give the tie beams their 24-inch width; the walls vary from 12 to 16 inches in thickness.

Traveling forms

Corbetta fabricated four timber travelers at the job site. A template was set up to guide the carpenters, and about 600,000 board-feet of lumber went into the job.

Each traveler was capable of forming and supporting a 60-foot-wide section at a time. Two travelers were used on each side of the center section, and work was so coordinated that 60-foot sections opposite each

(*Continued on next page*)

...MOST EFFICIENT PORTABLE TANDEM ROLLER MADE!

Hydraulically powered towing wheels "fold away" into the main frame to give the *new* 4-6 ton Buffalo-Springfield* Model KT-8 Portable Tandem Roller profit-making advantages never before offered *in any other roller!*

The KT-8's exclusive "fold away" feature permits maximum ground clearance . . . and completely *eliminates excessive overhang!* The KT-8 can work in tight corners . . . around obstacles . . . up against high curbs and forms . . . without removing the wheels. And the new "fold away" design lets the operator actually *see* his work at all times!

Hydraulically powered towing wheels save time, save money—on every job. The KT-8 is ready for transporting in minutes . . . and ready to go to work just that fast at the next job site!

There are other profitable features, too. Torque converter drive *automatically* matches power to grade and material variations . . . permits infinitely variable speeds from 0.5 to 5.3 mph in either direction. Heavy-duty, high-speed, low-torque clutches provide smooth reversing without grabbing. Wide faced bevel gears assure long, trouble-free operation. *The KT-8 is built for maximum performance, dependability and durability in every respect!*

Buffalo-Springfield also offers a new 3-5 Ton Model KT-7A Portable Tandem Roller. The KT-7A does not include hydraulically powered towing wheels but offers towing attachment as optional equipment. The attachment includes towing hitch with hydraulic jack, stub axle assemblies with pneumatic-tired wheels, and wedge blocks.

*Trademark Reg. U.S. Pat. Off.

NEW, illustrated booklet gives complete information on the sensational new Model KT-8. Get it today from your Buffalo-Springfield Distributor or write direct.

BUFFALO-SPRINGFIELD ROLLER CO.

DIVISION OF KOEHRING COMPANY • SPRINGFIELD, OHIO

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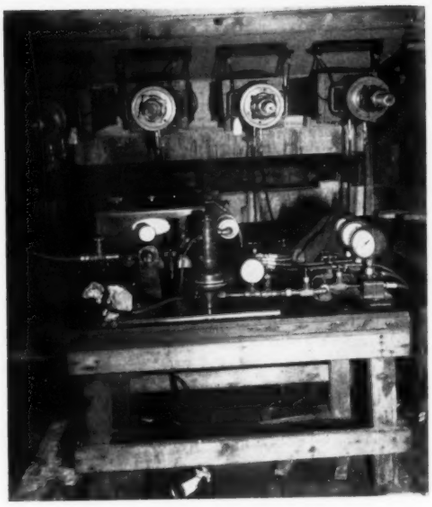
This is one of the two deadmen and 50-ton hydraulic jacks that hold cables taut on the upper wedge during the lowering process. Cables run from the upper wedge through sheaves on the lower wedge and to the deadmen.



One of the two hydraulic jacking platforms for each traveler, with four Wm. S. Pine 200-ton hydraulic jacks used to stress the 2¼-inch-diameter bridge cables taking the load of the cantilever.

other were picked up simultaneously by the cables. This prevented eccentric loadings from being introduced on the tie beams.

Each double-wedge traveler had 15 cross-braced timber panels to support the 130-foot-long × 60-foot-wide plywood cantilever form. Along the inclined plane separating the two wedges of a traveler were eight rows of screw jacks. Two rows straddled each of the four rows of double-flanged rail wheels and the four rails fastened to the bottom wedge. A total of 56 Simplex jacks was used to lower the upper wedge to the rails or raise it from the rails.

The bottom wedge also rode four rails, which were located on the ground. It was equipped with four rows of double-flanged wheels. These were raised from the rails as wooden wedges were driven under the row of posts on each side of the rails. The reverse process was used to lower the wheels. The wheels and rails of both wedges were used to strip, lower, and move the traveling forms; the screw jacks and wooden wedges were used to support the weight of concrete during pouring operations.

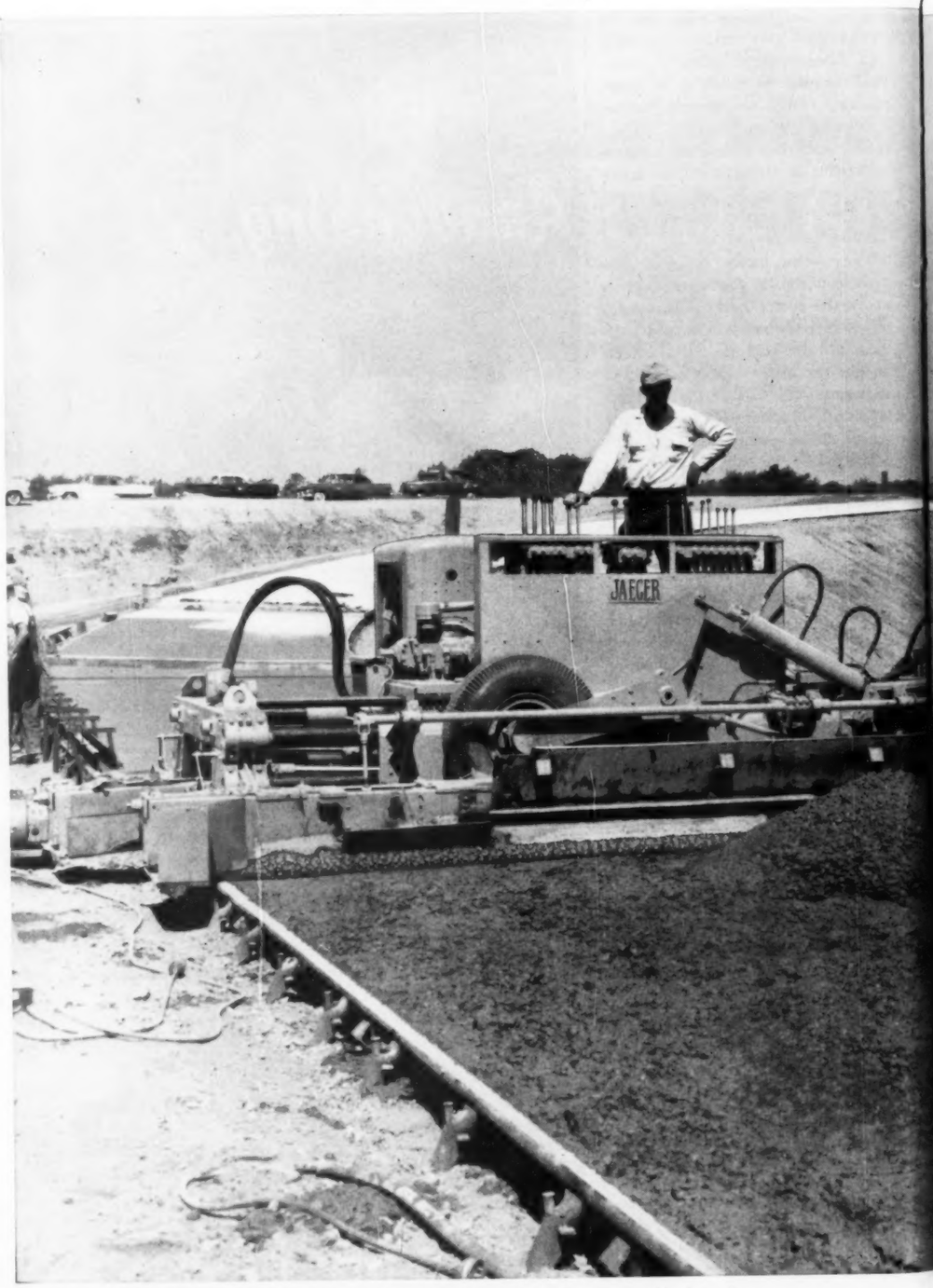
The upper wedge had to drop 6 feet vertically to clear the cantilever corrugations. This was done by allowing the bottom wedge to slip sideways; at the same time, the upper wedge was lowered, but restrained from any sideward movement. The actual movement, of course, was done by the wheels and rails between the wedges only after the screw jacks had been removed.

During this lowering operation, the upper wedge was kept from moving sideways by two cables attached to deadmen buried in the ground. The sideward movement of the bottom wedge was controlled by a Lima 802 crane so that the upper wedge could ride down the inclined plane without any horizontal displacement. The crane gently fed out the cable attached to the bottom wedge, allowing it to ride forward on the ground rails.

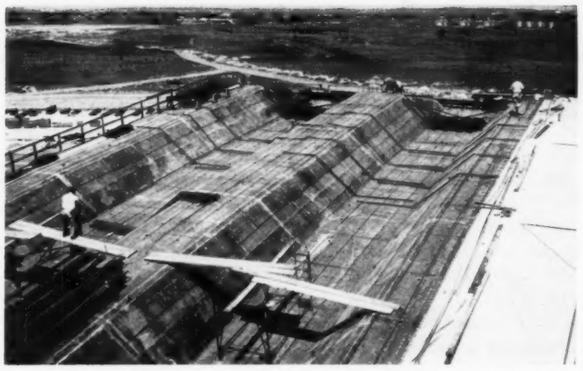
Work cycle

Corbetta used a two-week work cycle, from concrete placing to concrete placing, for travelers working in a pair on either side of the hangar center section. The concrete-placing operations were performed simultaneously on opposite sides of the center section. Here is how work was done on one side:

Lightweight, coarse-aggregate (Lelite) concrete, with sand as fine aggregate, was used to form the 4¾-inch-thick corrugated cantilever slab. The cantilever has valleys, about 5½ feet deep and 9 feet wide, which are separated from the crowns by 6



FINISHER ADJUSTED ITSELF TO SLAB WIDTHS VARYING FROM 12' TO 18' on this interchange, U.S. Routes 22 and 23 near Circleville, Ohio.



Plastic-coated plywood, 5/8 inch thick, makes it unnecessary for the form to be replaced throughout the job. The two corrugations, 5½ feet deep and 9 feet wide, are separated from the deck by a 6 to 5 slope. Pipe sleeves at each corrugation are for stressing cables.

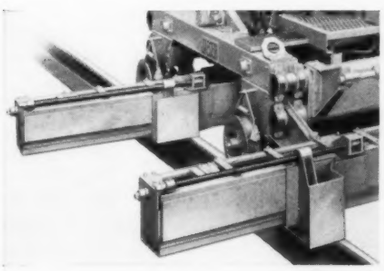
A Lima 802 crane uses a 100-foot boom and 30-foot jib to lift an Insley 1-yard laydown concrete bucket to the forms. Concrete, with Lelite for coarse and sand for fine aggregate, is ready-mixed.

Fully available for 1958

the all-hydraulic, self-widening

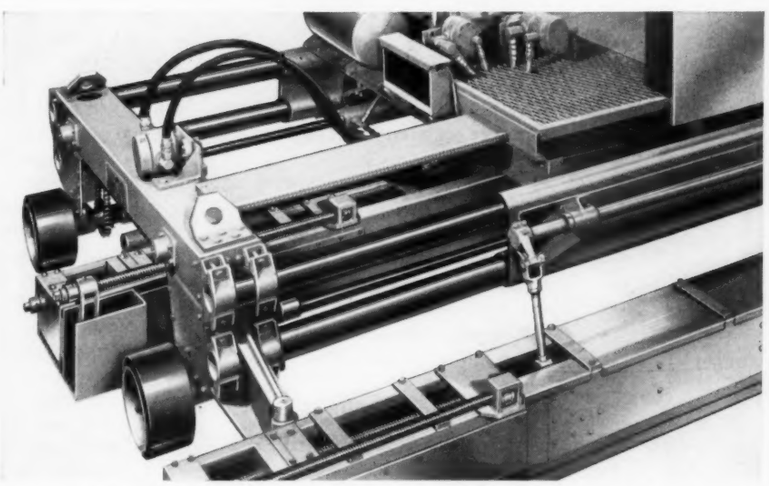
JAEGER "JX"

Accelerated winter production has enabled us to complete urgent back-orders on Type "JX" and "J" finishing machines. You can enjoy the advantages of this fast, flexible, precision-smooth finisher for your new slab work and get delivery, when wanted, by ordering now. See your Jaeger distributor, or write.



EVEN THE END SHOES ARE INFINITELY ADJUSTABLE

For variable width slab, Jaeger supplies 3′ screed extensions on which the end shoes adjust in or out on a screw merely by turning a rachet lever. Total 6′ of infinite adjustability (3′ at each end) is thus available to match the 6′ hydraulic adjustability of the finisher frame. With additional 2′ width adjustability by shifting wheels, standard 12′-18′ Jaeger can lay 10′-18′ width; 18′-24′ model lays 16′-24′; 24′-30′ model lays 22′-30′.



ALL-HYDRAULIC OPERATION gives you 6′ of infinite width adjustability with the touch of a lever — a tremendous time-saving on today's variable width work. Also gives you smooth, hydraulic drive and finger-touch control of traction, screeds, diagonal rear screed swing, tamper attachment and transportation wheels — all operations.

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to 5 sloping sides. Each traveler was capable of forming two complete valleys, which are spaced on 30-foot centers.

A Lima 802 crane, with 100-foot boom and 30-foot jib, was used with an Insley 1-cubic-yard laydown bucket to place the ready-mix concrete. The contractor used simple wooden frames, held 4¾ inches away from the 5/8-inch plastic-coated plywood forms, to support the low-slump concrete on the sloping sides of the corrugated slab.

The concrete was consolidated by Vibro-Plus vibrators and finished with wood floats and steel trowels before being water-cured for three days. Water for curing was sprayed on the concrete by perforated garden hoses placed on the crowns of the slab.

During the 3-day curing cycle, eight Bethlehem 2¼-inch-diameter bridge cables—four for each valley—were fastened to the gusset plates of the tie beams and fed through the 10½-inch-diameter pipe sleeves embedded in the anchor block at the outer end of the cantilever. Each cable came equipped with steel cable sockets so that it could be hooked up with the hydraulic jacks used for stressing. The cable sockets, pulled through the pipe sleeves by the crane, were held in position by a temporary lug placed between the socket and pipe sleeve. This allowed the contractor to position the two removable jacking platforms, each with four Wm. S. Pine 200-ton center-hole hydraulic jacks, on platforms built into each traveler. These jacking platforms, raised or lowered by a crane and riding on two channels in the traveler platform, were rolled into position by the work crew. Jacks were removed after cables had been stressed, but before the travelers were moved. This was a safety precaution, and it also prevented the jacks from being damaged when the upper wedge was being raised or lowered.

When concrete reached a strength of 2,500 psi, usually after three days, the cables were tensioned simultaneously on both sides of the center section. A total of 16 jacks, or four platforms, was required to handle the stressing of both the cantilevers during this operation. As the load was applied to the cables, shims were

(Continued from preceding page)

Concrete is dumped from the Insley bucket onto the deck, while Vibro-Plus vibrators consolidate the mix. The material is always worked onto the slope. The wooden screeds are used along the slopes to hold the dry-slump concrete in place.

placed behind the socket on the cable to permanently hold the cantilever. About 176 kips were required on each of the eight cables to raise the outer end of the cantilever 6½ inches. The circular shims were tack-welded together, and to the lug plate welded to the pipe sleeve, to prevent any possible movement. About 4½ inches of shims had to be positioned to hold the stressing load.

Each of the four banks of hydraulic jacks, powered by an air compressor located on the ground, was equipped with controls so that tension could be applied to all cables or to any one for minor adjustment.

Stripping of the forms was almost automatic once the stressing of the cables began. It started with wooden wedges being driven between the plywood form and concrete along the outer edge of the cantilever. Once this initial bond was broken, the concrete simply peeled off the forms as the cables were stressed. An advantage in the use of these heavy timber travelers—each weighing about 180 tons—was that it eliminated the possibility of the concrete sticking to the forms and lifting them off the ground while the cables were being stressed.

Moving travelers

During the concrete pouring and curing operations, the weight of the concrete slab was supported by the rows of timber posts on either side of the rail wheels of the traveler. The 56 screw jacks between the upper and lower wedges not only raised the wheels off the inclined rails but transferred the load to the bottom wedge. Wood sills and wedges kept the bottom wedge off the ground rails and transmitted the load directly to the ground.

When the upper wedge was ready to be lowered so that the traveler could move forward, it was fastened to the deadmen by cables passing through two sheaves attached to the bottom wedge. This prevented any sideward movement of the upper wedge. Two 50-ton hydraulic jacks, one for each deadman cable, were used to take up all the slack in the cables. This prevented the upper wedge from slipping forward after being lowered onto the rails of the bottom wedge.

Before the upper wedge was lowered by the screw jacks, a Lima 802 crane was positioned and the cable from one of its drums connected to the bottom wedge. This kept the bottom wedge from sliding out from beneath the downward thrust of the upper section. After all the cables from crane and deadmen were made taut, the upper wedge was lowered until its wheels made contact with the inclined rails.

The wooden wedges were then knocked out from beneath the lower wedge, allowing its wheels to contact the ground rails. Then, as the crane cable was slowly paid out, the bottom wedge moved forward and the upper wedge dropping vertically, rolled down the inclined rails. After dropping the required 6 feet the upper wedge was stopped by a wheel lug welded to the rails. At this point the crane cable was loosened and a 60-foot section of the deadman cable removed.

Corbetta used either a truck crane or a dozer to pull the traveler forward a distance of 60 feet over the ground rails. Here, the deadman cables were re-attached to the deadman and made taut, by the hydraulic jacks. The crane cable, re-attached to the bottom wedge, was used to pull the bottom wedge back about 22 feet. This caused the upper wedge to travel vertically up the inclined rails until it was directly beneath the adjacent 60-foot-wide pour.

Crews raised the upper wedge 5

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inches by replacing the 56 screw jacks and breaking the contact between the wheels and inclined rails. Wooden wedges were then re-driven under the posts to raise the bottom wedge off the rails. Screw jacks were covered with scabbing, and column clamps fastened to the upper and lower wedge posts, to prevent a jack from slipping. As soon as the wheels cleared the rails, the deadman cables were released and final form-elevation adjustments were made by the screw jacks.

This allowed carpenters to rebuild the forms for the 5-foot-high diaphragm wall which runs along, and on top of, the junction of the cantilever and the roof slab; metal lathers also began installing the reinforcing steel for the slab. After this work was done, concrete operations were resumed.

The traveling forms, though big and cumbersome, moved very readily and, according to the contractor, provided the most economical way to do the job. The contractor felt that the re-usable and re-salable salvage lumber will repay part of the expense incurred by setting up the huge travelers.

Central section

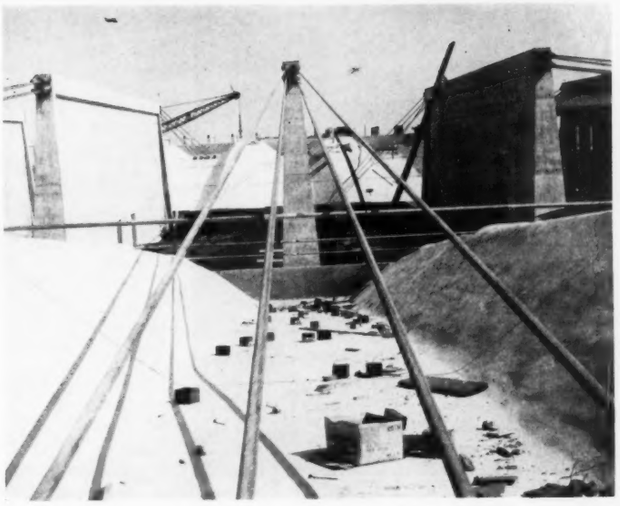
While the anchor walls spanning the central section support the tie beams for the cantilever cables, they also serve another function. Each acts as a beam with its 14½-inch-thick bottom flange incorporated into the roof slab of the center section. This flange beam, as it is designated, is 9 feet wide for about 20 feet on each end, and tapers down to widths of 6 and 3 feet at about mid-span. These flange beams, which made it possible to hang the second and third floors as desired, had to be poured before the lower floors. The beams required 40-foot-high shoring, with 10 × 10-inch posts and 15-inch I-beam joists, until they were ready to support a hung load.

Two exterior concrete columns, spaced on 30-foot centers, support the 100-foot-long flange beams. These, in turn, support the anchor walls, which are also on 30-foot centers, and the roof. Fifteen No. 18 steel bars, 15 feet long, were encased at each end of the flange beam and allowed to protrude about 7½ feet. These bars were then embedded in the cantilevered slab at each valley. The slab at this hinge point is about 12 inches thick.

The second and third floors are hung from the flange beams for the first four northern bays (120 feet), and for five bays at the southern end of the building. At the south end, part of the second floor is cut away to form a mezzanine. This floor, as well as the third floor, was hung in this area to provide the first floor with a columnless area spanning 100 feet.

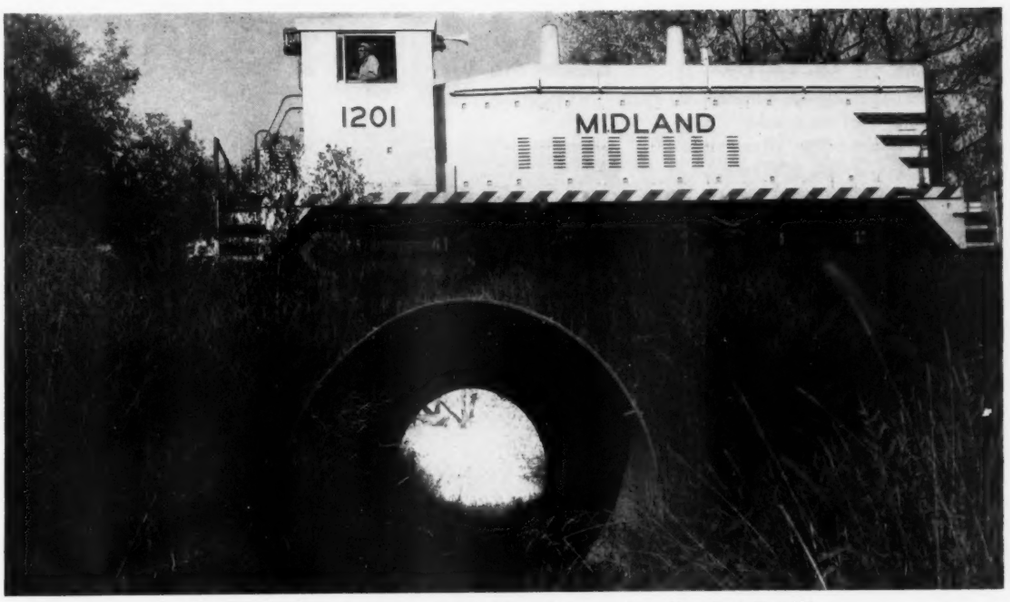
Hangers were formed by four steel rods—3⅛ inches in diameter for the third floor and 2 inches in diameter for the second floor—encased in the

(Continued on next page)



The anchor walls which span the 100-foot center section are 30 feet high and spaced on 30-foot centers. The walls support tie beams with anchorage plates at each end to receive the Bethlehem 2¼-inch cables supporting the outer ends of the cantilevers.

"Armco Drainage Structures help us speed up installation"



Under this industrial railroad to the Midland Collieries, Inc., is an Armco MULTI-PLATE Pipe, 102 inches in diameter. Many other Armco Drainage Structures are installed under this same line.

So said Mr. H. W. Hartmann, Vice President of McDougal-Hartmann Co., well-known engineers and contractors of Peoria, Illinois. He was referring to his company's installation of Armco Corrugated Metal Drainage Structures on a nine-mile railroad line for Midland Collieries, Inc., of Victoria, Illinois.

Time was an important factor in this job because the coal corporation wanted to use the railroad before winter set in. Not only did the contractor find the Armco Structures time saving, but Mr. Hartmann also said, "Armco Structures were more economical to install."

The drainage project—involving Armco MULTI-PLATE® Pipe and Pipe-Arch—included a total of 8 structures; diameters (or equivalent) range from 78 to 168 inches, and have a total length of 566 feet.

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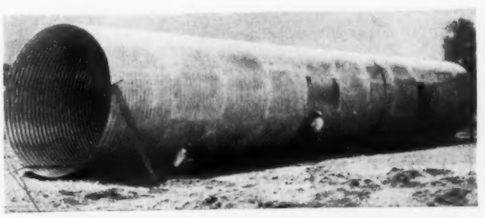

Here is another Armco MULTI-PLATE Pipe, 168 inches in diameter, in final stages of assembly, for installation under the same railroad line.

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At the south end of the center section, the second floor is being hung from the third floor so that an unobstructed area will span the 100-foot width of the building on the ground floor. Hangers with 2-inch steel rods will be embedded in the floor slab. Only part of the second floor is being built here to provide a mezzanine.

concrete slabs. The rods were tied to a steel cribbing made of channels. The four rods were then encased in a concrete column. The remaining bays called for typical interior-column construction to support the second and third floors on 2-foot-square columns. Waffle-slab construction was used to form all floors.

Personnel

Ray Vitolo is the project manager; Walter Lee, the assistant project manager; Joe Gardeski, the project engineer; and Walter Campana, the steel superintendent, for Corbetta. Charles J. Prokop, vice-president of Corbetta Construction, had the idea for the unique forms, and he was responsible for their planning and use. Herbert Fleischer, New York, N. Y., worked out the structural design for the travelers. Chester L. Churchill is the architect-engineer for Pan American, and Ammann & Whitney, New York, N. Y., is the structural engineering firm on the work.

THE END

HRB on economic impact of highway improvement

HRB Special Report 28, "Economic Impact of Highway Improvement", summarizes the reports and discussions at the Conference on Economic Impact of Highway Improvement sponsored by the Highway Research Board at the suggestion of the American Association of State Highway Officials.

The material deals primarily with the economic impact of highways on land values, land-use changes, the central business district, mass transit, local government structures, and urban land and community planning. Descriptions of completed and current projects are given, and suggestions made for further research.

This booklet may be obtained for $2.80 from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Convention calendar

February 10–13 Associated General Contractors of America

Thirty-ninth Annual Convention, Statler-Hilton Hotel, Dallas, Texas. Wm. G. Dooly, Jr., public relations director, AGC, Munsey Bldg., Washington 4, D. C.

February 10–13 National Sand and Gravel Association and National Ready Mixed Concrete Association

Annual Convention and Exhibit, Conrad Hilton Hotel and Chicago Coliseum, Chicago, Ill. Vincent P. Ahearn, executive secretary, NSGA-NRMCA, 527 Munsey Bldg., Washington 4, D. C.

February 10–14 American Society for Testing Materials

Committee Week, Hotel Statler, St. Louis, Mo. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia 3, Pa.

February 12–14 High-Speed Computer Conference

Conference, Pleasant Hall, Louisiana State University, Baton Rouge, La. J. W. Brouillette, director general extension division, HSCC, Louisiana State University, Baton Rouge, La.

February 13–15 National Society of Professional Engineers

Meeting, Kellogg Center, Michigan State University, East Lansing, Mich. Charles L. Ritchie, assistant to the executive director, NSPE, 2029 K St., Washington 6, D. C.

February 17–19 Association of Asphalt Paving Technologists

Meeting, Sheraton-Mt. Royal Hotel, Montreal, Quebec, Canada. Ward K. Parr, secretary-treasurer, AAPT, 1224 East

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Engineering Bldg., Box 376, Ann Arbor, Mich.

February 20–21 Highway Engineering Conference of University of Colorado

Conference, University of Colorado, Boulder, Colo. Roderick L. Downing, chairman, HECUC, 207 Engineering Bldg. No. 1, University of Colorado, Boulder.

February 20–21 Mississippi Highway Conference

Conference, University of Mississippi, University, Miss. D. C. Trexler, director department of conferences and institutes, MHC, P. O. Box 154, University, Miss.

February 24–27 American Concrete Institute

Fifty-fourth Annual Convention, Morrison Hotel, Chicago, Ill. A. Allan Bates, general chairman, ACI, P. O. Box 4754, Redford Station, Detroit 19, Mich.

February 24–28 American Society of Civil Engineers

Convention, Sherman Hotel, Chicago, Ill. Don P. Reynolds, assistant to the secretary, ASCE, 33 W. 39th St., New York, N. Y.

February 25–27 Illinois Highway Engineering Conference

Annual Conference, Illini Union Bldg., University of Illinois, Urbana, Ill. John W. Hutchinson, assistant director, IHEC, 303 Civil Engineering Hall, University of Illinois, Urbana, Ill.

February 26–28 Association of Highway Officials of North Atlantic States

Meeting, Emerson Hotel, Baltimore, Md. Kenneth D. Rice, secretary, AHONAS, 1035 Parkway Ave., Trenton, N. J.

February 27–28 Illinois Traffic Engineering Conference

Annual Conference, Illini Union Bldg., University of Illinois. John E. Baerwald, conference director, ITEC, 401 Civil Engineering Hall, University of Illinois, Urbana, Ill.

March 3–5 Utah Highway Engineering Conference

Nineteenth Annual Conference, Union Bldg., University of Utah, Salt Lake City, Utah. Prof. Grant K. Borg, head of civil engineering department, UHEC, University of Utah, Salt Lake City, Utah.

March 11–15 American Concrete Pipe Association

Fiftieth Annual Convention, Roosevelt Hotel, New Orleans, La. Howard F. Peckworth, managing director, ACPA, 228 N. La Salle St., Chicago 1, Ill.

March 11–15 Civil Engineering Conference

Conference, Student Service Center, University of Florida, Gainesville, Fla. Dr. F. W. Gilcrias, research professor, CEC, Department of Civil Engineering, University of Florida, Gainesville, Fla.

March 12–13 Kentucky Highway Conference

Meeting, Memorial Hall, University of Kentucky, Lexington, Ky. D. K. Blythe, head of civil engineering department, University of Kentucky, Lexington, Ky.

March 17–21 National Association of Corrosion Engineers

Fourteenth Annual Conference and Exhibition, Municipal Auditorium, San Francisco, Calif. A. B. Campbell, executive secretary, NACE, 1051 M & M Bldg., Houston 2, Texas.

March 23–29 American Congress on Surveying and Mapping and American Society of Photogrammetry

Eighteenth Annual Meeting of the ACSM and Twenty-fourth Annual Meeting of ASP, Conventions and Co-exhibits, Shoreham Hotel, Washington, D.C. ACSM Meeting is from March 23–26; ASP from March 26–29. ACSM, Box 470, Washington 4, D. C.; ASP, 1515 Massachusetts Ave., N. W., Washington 5, D. C.

March 26–28 New York State Association of Highway Engineers

Nineteenth Annual Convention, Manger Hotel, Rochester, N. Y. Russell F. Lewis, general chairman, NYSAHE, 527 Arnett Blvd., Rochester 19, N. Y.

March 31–April 2 South Dakota Highway Short Course

Meeting, Union Building, South Dakota State College, Brookings, S. Dak. Emory E. Johnson, professor of civil engineering, SDHSC, South Dakota State College, Brookings, S. Dak.

April 2–4 Ohio Highway Engineering Conference

Conference, Ohio Union, Ohio State University, Columbus, Ohio. Emmett H. Karrer, general chairman, OHEC, Brown Hall, Ohio State University, Columbus 10, Ohio.

April 6–12 Concrete Reinforcing Steel Institute

Meeting, The Boca Raton Hotel, Boca Raton, Fla. H. C. Delzell, managing director, CRSI, 38 S. Dearborn St., Chicago 3, Ill.

April 7–8 Wire Reinforcement Institute

Meeting, The Boca Raton Hotel, Boca Raton, Fla. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington 4, D. C.

April 7–10 Purdue Road School

Meeting, Union Building, Purdue University, West Lafayette, Ind. Ben H. Petty, professor of highway engineering, PRS, School of Civil Engineering, Purdue University, Lafayette, Ind.

April 11–12 Texas Aggregate Association and Texas Ready Mixed Concrete Association

Fourth Joint Annual Convention, Gunter Hotel, San Antonio, Texas. Ray L. Cain, executive secretary, TAA-TRMCA, 201 Perry Brooks Bldg., Austin 1, Texas.

April 14–16 American Wood Preservers' Association

Meeting, Hotel Statler, Los Angeles, Calif. W. A. Penrose, secretary-treasurer, AWPA, 839 17th St., Washington 6, D. C.

April 14–17 Design Engineering Conference

Conference, International Amphitheater, Chicago, Ill., sponsored by the American Society of Mechanical Engineers. ASME, 29 W. 39th St., New York 18, N. Y.

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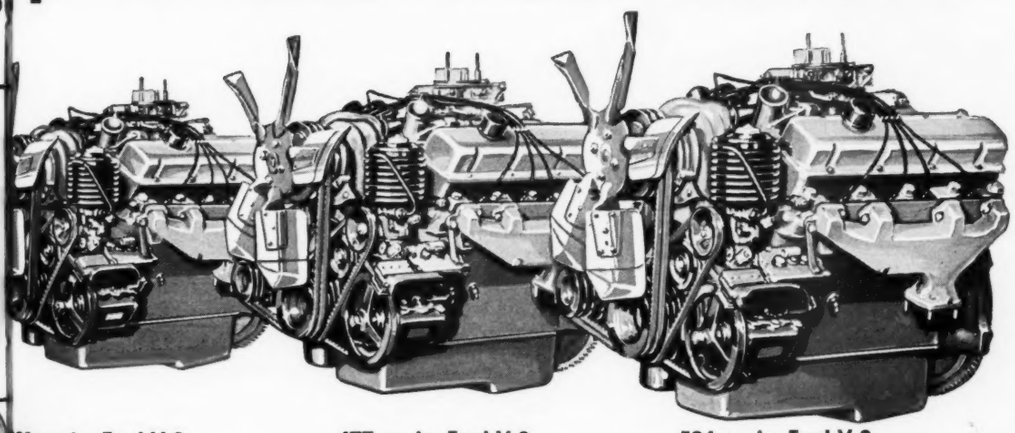

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10 BIG NEW EXTRA-HEAVY TRUCK SERIES

GVW's up to 51,000 lb. For '58, ten new basic series are added to Ford's already extensive Heavy and Extra Heavy Duty line. Four new Tilt Cabs, four new Conventionals, and two new Tandem models offer GVW ratings up to 51,000 lb.

GCW's up to 75,000 lb. New T-950 Tandem is rated for 75,000-lb. GCW. Biggest single-rear-axle models are rated for 65,000-lb. GCW.

Front-axle capacities up to 15,000 lb. Choice of three front axles in most new Ford Extra Heavies. Rated capacities of 9,000, 11,000 and 15,000 lb.

Rear-axle capacities up to 29,000 lb. Wide choice of rear axles includes single-speed and two-speed, single reduction and double reduction types. Capacities range from 18,000 lb. to 29,000 lb.

Bogie-axle capacities up to 38,000 lb. For '58 there are *five* Ford basic tandem axle models. Biggest of the *five* is the brand-new T-950 which features a tandem rear-axle assembly rated for 38,000 lb. Other bogie-axle capacities range down to 22,000 lb. for Ford Series T-700.

New transmissions. Roadranger transmission available in all ten new Ford Heavies. Up to 33% less shifting. Engines operate in peak horsepower range, use less fuel. "Short Fourth" transmissions also available on "F" and "C" Series.

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Omark plans expansion

Plans to bring its saw chain and fastening divisions under one roof have been announced by Omark Industries, Inc., Portland, Oreg. A 25-acre site has been purchased near the present plant, and the firm plans further product diversification and expansion.

Omark produces a line of powder-actuated tools to fasten wood, metal and composition to concrete and steel, and also a line of saw chains and accessories.

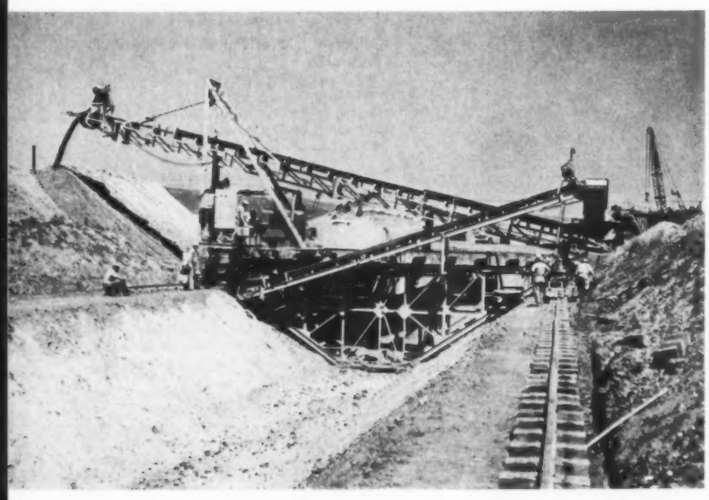
HRB bulletin reports on traffic accidents

Bulletin 161, "Investigating and Forecasting Traffic Accidents", can be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The bulletin abounds in tables and graphs, and is priced at $1.20.

About 40 per cent of the excavation for the canal is handled by scrapers. These three Cat DW21's are working in sandstone that has been ripped by a tractor-ripper combination.

More than half the digging for the 13-mile-long canal section is done by this P&H Model 1055 dragline with Hendrix bucket. The rig gets to within 10 inches of the grade.

This small Case Terratrac tractor, equipped with an angledozer, handles a job impossible for a larger machine: it fine-grades the berms just above the canal.



Riding rails set on the berms, a Guntert & Zimmerman trimming machine cuts the sides and bottom of the canal to exact grade for the 10.1-foot-deep section that has 10-foot-wide flat bottom and 1½ to 1 side slopes.

Big machines are fast on trimming, lining canal

Specialized rigs make 1,250 linear feet daily as they finish and line 13-mile section of irrigation canal

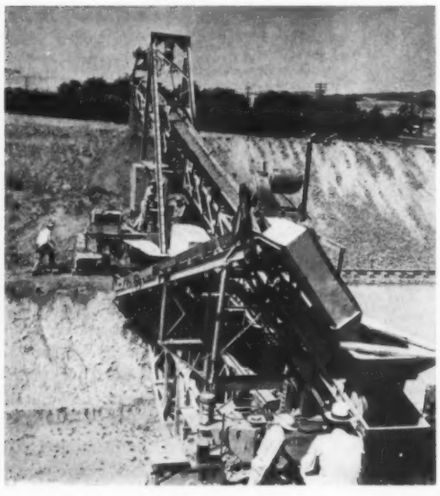
by **RALPH MONSON**
field editor

Two highly specialized canal machines, one for trimming and one for lining, enabled a contractor to work at a rate of 1,250 linear feet of lining placed per 8-hour day, and to chop six months' working time off a job.

The contractor was Vinson Construction Co., Phoenix, Ariz., and the job was the second reach of the Putah South Canal near Vacaville, Calif.

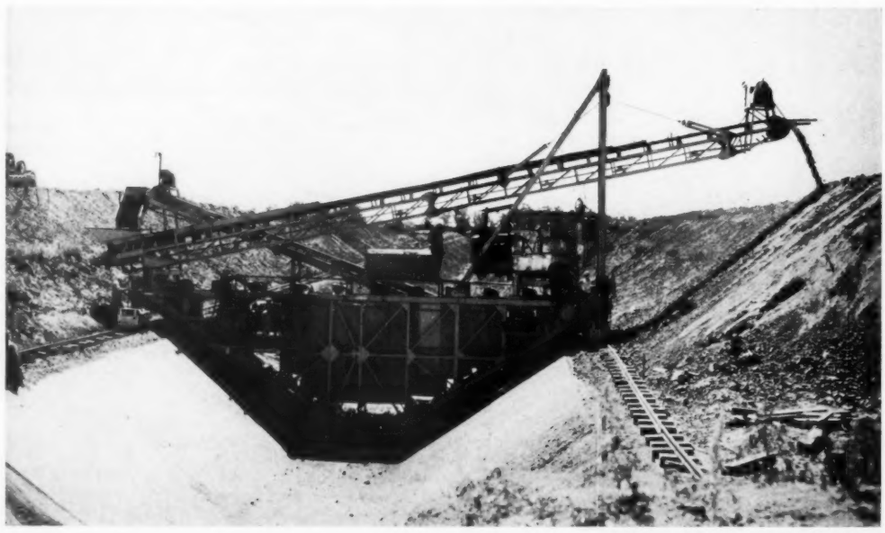
This canal, under construction by the U. S. Bureau of Reclamation, is the main distribution artery for the Solano Irrigation project. The first 6-mile section of the canal and the 13-mile section handled by the Vinson firm are complete; the 8.7 miles making up the third section is scheduled to be finished this year under a $1.2 million contract by Marshall & Haas, Belmont, Calif.

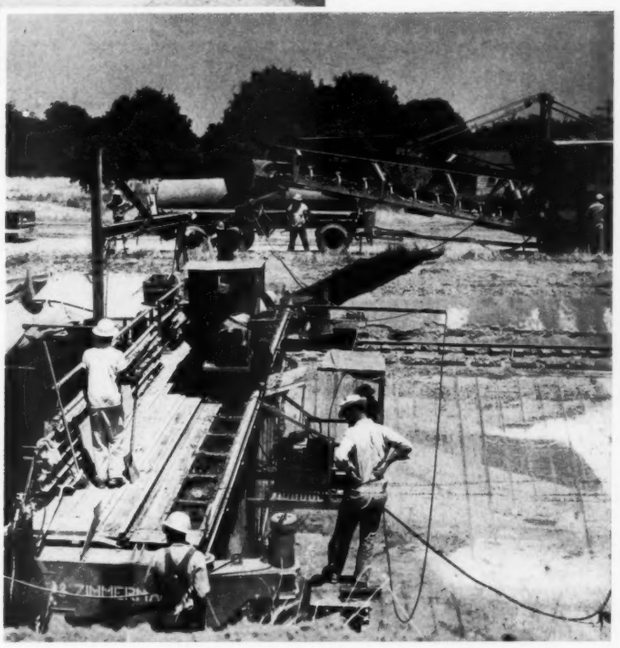
The Solano Project uses water stored in Lake Berryessa, behind the recently completed Monticello Dam, to irrigate a potential area of more than 130,000 acres. The Putah South Canal begins at the Putah Diversion Dam about six miles below Monticello Dam, near Winters, Calif. From here, it travels generally southward for 33 miles to a terminal reservoir near Cordelia. The distribution system



Buckets on a continuous chain dig down the left side of the canal, across the bottom and up the right side, dumping the dirt to a short stacking conveyor. The conveyors and traveling mechanism are both electrically powered by a generator set. The buckets are driven by an Allis-Chalmers HD-10 tractor with the tracks removed.

(Additional photo on front cover)





Right behind the trimmer, the Guntert & Zimmerman lining machine rides the same rails to place the 3-inch-thick lining. It is fed with concrete by a Koehring 34-E Twinbatch paver, which has a conveyor riding the boom. The mix goes to a transfer car operating across the rig on a 45-second cycle—the time needed to mix a batch. The mix works down the tremies to be consolidated and screeded; then workmen on the finishing jumbo place contraction joint markers and complete the finishing.

will be constructed by the Solano Irrigation District.

In the second reach, the finished canal has a 10-foot-wide flat bottom with 1½ to 1 side slopes. For a portion of the length, the section is 10.1 feet deep; the remainder is 8.75 feet deep. The concrete lining is 3 inches thick.

Scrapers start excavation

The 1,092,000 cubic yards of common excavation—with provision for adjustment compensation if rock was encountered—were sublet to Darkenwald Construction Co., Sacramento, Calif. The subcontract covered the placing of some 4,700 linear feet of concrete pipe in sizes ranging from 8 to 54 inches in diameter. This part of the work also included the placing of 120,000 cubic yards of compacted fill in areas where the canal was above the normal ground level.

Using a spread of three Caterpillar DW21 scrapers and a Caterpillar D9 tractor-dozer for push-loading, the grading contractor first took out enough material to build the fills. Hauls went up to three-quarters of a mile, but the average haul was about 1,500 feet. Embankments were spread in thin layers by a D8 tractor-dozer, watered, and compacted with a double Southwest 5×5-foot sheepsfoot roller pulled by a D8. In all, the scrapers took out about 40 per cent of the total excavation.

To do the major part of the digging, Darkenwald used a P&H Model 1055 dragline with a Hendrix 4-yard lightweight bucket. This rig dug to within about 10 inches of finished subgrade, casting the spoil to both sides. In a few deep cuts, recasting was necessary to get the material back far enough from the edges of the canal.

A D6 tractor-dozer followed the dragline, roughly trimming the ditch to the desired grade. The contractor tried to be particularly careful not to excavate too deep, since any backfill would require special compaction. Instead, the excavating crews tried to leave about 10 inches of material to be taken out by the trimmer.

In one area, a semi-hard sandstone was encountered, and this material had to be ripped before it could be loaded by the scrapers. A D8 trac-

(Continued on next page)

An aluminum curing jumbo, used by Techkote Co., El Segundo, Calif., covers the entire canal with compound sprayed by 22 nozzles. Two workmen push the frame along on the rails. A pickup on the berm delivers the compound.

(*Continued from preceding page*)

Hard sandstone, encountered in this area, is ripped by a LeTourneau-Westinghouse ripper pulled by a D8. The two teeth of the ripper loosen the material so that scrapers can rough out the canal.

tor, pulling a LeTourneau K-30 ripper with two teeth, loosened and broke up the rock, although it sometimes required the assistance of the D9 push-tractor when the going was tough.

Ground water in a swampy area gave the trench a soft, wet bottom unsuitable for the normal trimming and lining operations. In both the rock and wet areas, the trench was dug to below the normal trim grade, and a blanket of pit-run gravel was placed ahead of the lining operation. This gravel blanket was placed on about four miles of canal under this contract.

Grading berms

Since the trimming and lining machines travel on rails laid on the berms just above the top of the canal lining, it was important that these berms be accurately graded. The grading crew used the DW21 scrapers to shape the berms to approximate grade. Then, just ahead of the trimming operation, a little Case Terra-trac tractor-dozer fine-graded the berms to within a tolerance of less than 4 inches. This small tractor with an angle dozer easily worked the narrow berms, doing a job impossible for a larger machine.

Sections of the 60-pound railroad rail with ties attached, used by the trimmers and liners, were picked up by a Lorain MC-504 motor crane and stacked on a big trailer pulled behind the crane. A load of these rails was brought ahead and strung out on the graded berms. The 2-foot-long ties were attached to the rail at 2-foot centers with track spikes. The rail sections were joined with standard fish plates. Vinson used 8,000 linear feet of the rail, enough for 4,000 feet of canal.

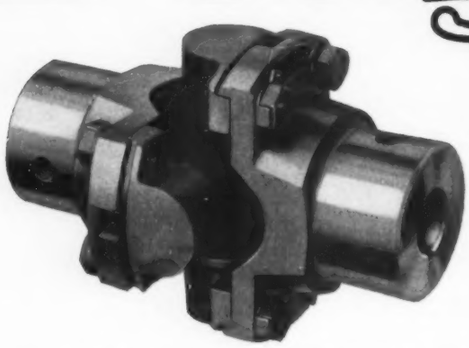
The left rail, used as a guide rail to control the alignment of the machines, was pinned down with steel pins at a 1.25-foot offset from the line hubs. The rail on the right bank was set at the approximate gage of 47.75 feet from the left rail, but no attempt was made to set it exactly. The double-flanged wheels of the trimming and lining machines were mounted to follow the roughly aligned right rail without transferring any misalignment to the finished section.

Trimmer shapes trench

The Guntert & Zimmerman trimming machine used on this job consisted of a big jumbo the shape of the canal section with digging buckets on an endless chain and conveyors to remove the spoil. The digging unit has 23 buckets, each 14 inches high, 16 inches deep, and 24 inches wide, which are fitted with digging teeth. An Allis-Chalmers HD-10 tractor without the tracks, mounted on the top of the jumbo, drives the digging chain with its drive sprockets.

The buckets dug down the left side of the canal, across the bottom, and up the right side. At the top, they dumped their loads onto a short conveyor which led to a sloping elevator

Designers



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conveyor across the front of the machine. This conveyor discharged onto a long stacking conveyor which carried the dirt up out of the canal and onto the spoil bank. On this job, the stacking conveyor was generally used 57 feet long, but it can be extended to 79 feet if conditions require.

The three 24-inch conveyors, the traction wheels, and the hydraulic system of the trimmer are run by electric motors powered by a GM 75-kw diesel-generator set mounted on the rear of the jumbo. The complete trimmer weighs about 45 tons.

To get the finished grade to exact elevation, crews strung a grade wire along both sides of the rig to serve as a guide. Hydraulic jacks raised and lowered the machine as required to match this grade. Since the trimmer usually takes no more than a 6-inch cut at a time, it was usually necessary to make two passes to remove some 10 inches of material left by the grading crew.

To keep pace with the lining machine, which places 1,250 linear feet of lining in an 8-hour shift, the trimming machine had to operate two 9-hour shifts.

Although the 45-ton trimmer strips down to about 33 tons for transport, it is still a tricky operation to take the big awkward machine out of the trench and get it back in again. (See "Getting Big Canal Liner Across Busy Highway Is Difficult Moving Job", pg. 56.)

Following the trimmer, a D8 tractor-dozer spread the spoil bank left by the trimmer. The dozer and a Caterpillar No. 12 motor grader maintained haul roads on both berms. The road on the left berm became the permanent operating road for the project.

Place concrete lining

The Guntert & Zimmerman lining machine, which followed right behind the trimmer, placed the 3-inch-thick concrete lining for the entire canal section in a continuous operation as it moved along the rails. The liner, like the trimmer, is a big jumbo which rides on the rails and fits down into the cross section of the canal.

Across the top of the liner are a pair of rails which carry a transfer car. This electrical powered car has a 1.5-cubic-yard hopper which is filled with concrete from a Koehring 34-E Twinbatch paver. The transfer car travels across the deck of the liner, depositing the concrete through its bottom-opening gate into a series of tremies. The tremies lead vertically from the top deck to a series of pockets around the shoe which forms the shape of the finished section of canal.

Along the sides and bottom of the liner shoe, a tubular vibrator keeps the concrete flowing and consolidates it as the liner moves along.

Immediately behind the placing shoe is a 3-foot-wide press plate which strikes off and finishes the concrete. As the liner moves along, a pair of joint cutters marks longitudinal 1-inch-deep contraction joints in the sides of the lining, about a foot up from the bottom.

Close behind the lining machine was a finishing jumbo, which consists of a framework carrying a platform across the bottom of the canal, plus a stairway up each side. This gave access for workmen who placed the transverse joint markers every 12½ feet and completed finishing the lining.

The lining machine operates entirely by electric power supplied by a GM 75-kw diesel generator set mounted on the machine. A 3-hp electric motor drives the transfer car back and forth across the deck, as it makes a trip every 45 seconds to match the mixing time of the paver.

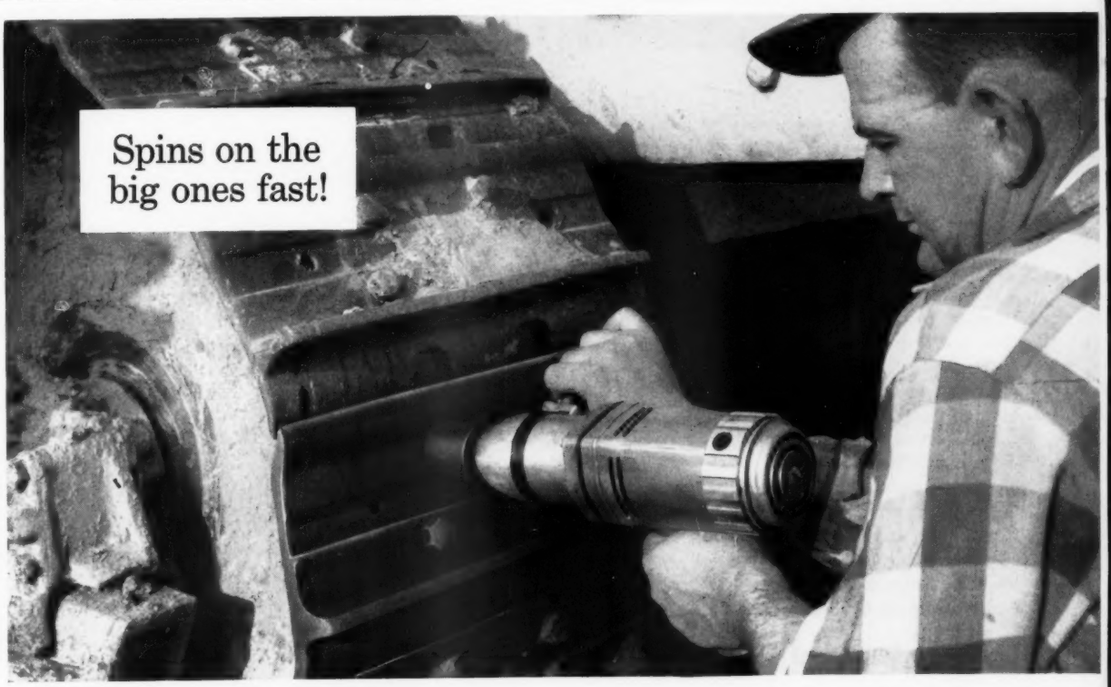
As with the trimming machine, the grade was established by a tightly drawn grade wire, and the machine was held to exact grade by a series of hydraulic jacks.

Batch plant supplies mix

The Koehring 34-E paver which produced the concrete was a standard highway-type paver, but its bucket had been replaced with a conveyor suspended from the boom. As the transfer car neared the side of the liner, the paver operator tripped the discharge chute, and the concrete began traveling out on the conveyor. By skillful timing, the operator of the transfer car always managed to get his hopper under the conveyor so that none of the concrete was spilled.

Six Mack trucks, each carrying four of the 1.4-cubic-yard dry batches, supplied the paver under all but the longest of haul conditions.

The batches were proportioned in a Conveyco 100-ton batch plant. Three sizes of coarse aggregate, with maximum sizes of ⅜, ¾ and 1½ inches, were dozed to a bucket elevator by a Cat D6 tractor-dozer. The conveyor deposited the materials on a vibrating screen at the top of the plant. Here they were rescreened to remove fines before being dropped



New B&D 300 Impact Wrench slashes equipment down-time!

MORE POWER PER POUND: this lightweight (only 13 lbs.) tool really packs a powerful punch!

LONGER LIFE! Torture tests show it has higher performance, cooler running, longer life than competition.

EASIER HANDLING! Pistol grip positioned to eliminate nose or tail heaviness. No starting torque twist. All-position auxiliary handle.

NO. 100 IMPACT WRENCH: the rugged wrench for smaller applications; hits maximum torque in just six seconds!

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A 3c stamp will bring you a demonstration of the tool that slashes tractor pad replacement time from hours to minutes—takes the back-break out of a tough job! Users report it's a cinch—just burn off the old head, punch the bolt through. Then, insert new bolt and run it up—*fast*—with the new B&D No. 300 Impact Wrench!

Packing a minimum of 300 ft. lbs. of torque and capable of handling bolts as large as 1¼" effortlessly, this new B&D power-built tool has thousands of uses. Use it for structural steel sub-assembly and final assembly; to remove heavy, dirt-encrusted truck lugs. Look about you. Chances are you'll find many uses for this tough, versatile tool! THE BLACK & DECKER MFG. CO., Dept. 1302, Towson 4, Md. (In Canada: Box 278, Brockville, Ont.)

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For more facts, circle No. 235→

Batches are supplied to a Mack truck by this Conveyco plant. The bins hold three sizes of coarse aggregate and sand that were delivered by a bucket elevator. Cement is stored in the two silos, which have a combined capacity of 1,000 barrels.

into the respective compartments of the bin. Sand was handled by the same elevator, but was not re-screened.

Cement was trucked from the plant at Permanente, Calif., and stored in two silos with a combined capacity of 1,000 barrels. The cement was conveyed to a compartment of the plant from which it was weighed out in a separate weigh bucket. The aggregates were weighed cumulatively, and the two were dumped together into the compartment of the batch truck.

The batch trucks made the hauls on the job road along the berm of the canal. Since busy U.S. 40 slices through the middle of the job, the contractor decided to use two settings of the plant rather than take any chances by hauling across the highway.

The first setting, at about the quarter point of the job, supplied materials for the operations north of the highway. Then, during a 3-day shutdown while the equipment was being moved across U.S. 40 and while some maintenance work was being done on the trimmer and liner, the plant was moved to a new location about halfway between the highway and the end of the job.

The dry batches were hauled to the paver, which towed a 3,000-gallon tank-trailer to supply mixing water. This supply was replenished by a 3,000-gallon nurse truck which hauled from local supplies along the right-of-way. An electric pump on the towed trailer quickly transferred the water from the nurse truck.

A typical batch of the lining concrete contained:

Cement	675 lbs.
Sand	2,100 lbs.
Rock (1½-inch)	1,305 lbs.
Rock (¾-inch)	890 lbs.
Rock (⅜-inch)	675 lbs.

The water content of the mix was carefully controlled to produce concrete with about a 3-inch slump. Durair air-entraining agent was added to increase the air content.

The furnishing and application of the white pigmented concrete curing compound was sublet to Techkote Co., El Segundo, Calif. Using a spray jumbo with 22 spray nozzles, Techkote covered the entire cross section of the canal at one time. The light aluminum frame was carried on wheels on the rails and was propelled by a workman on each end.

The curing compound and the power pump which fed the jumbo were carried in a truck which stood on the berm alongside the canal. The workmen usually pushed the machine ahead about 50 feet to apply a thin coat of the compound. Then they pulled it back over the same area, applying a second coat that provided a very uniform application.

In the four miles of the canal where rock or water were encountered, the lining operation was a little different. Here, the excavating contractor had carried the grade down below normal finished grade and the trimmer was not used at all. A blanket of about 4 inches of gravel was

NEW A-W ROLLER-COMPACTOR*

Three states prove that machine makes large savings possible

Deep penetration vibratory compaction and static weight surface rolling can now be accomplished in a single pass by the new A-W Roller-Compactor. On-the-job operation of this dual machine in Oklahoma, Louisiana and Pennsylvania has shown that it can make significant savings in man and equipment-hours.

The original test in Pennsylvania, which led to State approval of the machine, was carried out on a highway relocation job near Harrisburg. Preparation of the roadbed required straight excavation, with no borrow. Largest fills were 25 ft. After grading and soil compaction, stone for a 10-in. thick base was put down in a single lift. All the stone passed a 4-in. screen, 85-100% a 3½ in. Following spreading and initial compacting with the A-W Roller-Compactor, the stone was choked with screenings, 100% passing a ⅜-in. screen, 85-100% a No. 4 screen, 10-30% a No. 100.

In this operation, the static weight of the roller (10 tons) held the stone in place while the deep, penetrating action of the vibrating shoes quickly filled the voids with screenings. No auxiliary rollers were necessary.

Engineers of the Pennsylvania Department of Highways testing laboratory checked the job with inspection holes to determine if the screenings were evenly distributed throughout the thickness of the stone base and if the stone itself was firmly keyed together. This check, plus measurements based on the yield needed to compact 1 cu. yd. to the required 10-in. depth, showed that the new machine had done a job exceeding the minimum requirements. The engineers then recommended that it be approved for highway construction work in Pennsylvania.

Time studies on this job showed a saving in man and equipment-hours of better than 25% compared with methods then employed which used a single-purpose vibratory compaction unit followed by a separate 3-wheel, 10-ton roller. It was estimated that a contractor using the A-W Roller Compactor on stone base could reduce his compaction bid by 10c per sq. yd.

Spectacular results were also obtained with this machine in on-the-job operations in Oklahoma and Louisiana. For complete test details and for technical information on the A-W Roller-Compactor, see your nearby A-W distributor or write to us.

COST ANALYSIS OF A JOB IN OKLAHOMA

Equipment	No. of lifts required	Rolling time per lift (hr.)	Equipment time (total hr.)	Cost per hr.	Total cost per mile	Savings
Sheepsfoot roller and two pneumatic tire rollers	9	8	216	$12.50	$2700	—
A-W Roller-Compactor	4	11	44	$12.50	$550	$2150

This cost analysis of compaction work on soils and stabilized gravels in McCurtain County, Okla., reveals the remarkable cost reduction made possible by the A-W Roller-Compactor. Additional savings resulted because (1) Less water was required for sprinkling—the deeper lifts used with the A-W retained moisture better during compaction; (2) the roller-compactor method required only one machine and operator instead of several pieces of equipment with an operator for each; (3) motor graders and water wagons could be used more efficiently, because they could prepare material ahead of the compacting area without having to stand by for compaction of each 2-in. lift.

*Patents applied for

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

first placed by the lining machine. Then the machine made a second pass to place the concrete lining.

Pit-run gravel was run over a scalper to remove oversize, and this material was loaded into the batch trucks by a Hough Model HM Payloader shovel. The gravel was run through the concrete mixer, where water was added to increase the stability on the steep side slopes. The lining machine then placed the gravel blanket in the same manner used to place the lining.

After making a day's run on the gravel blanket, the lining machine moved back and, next day, laid the concrete lining.

To relieve the hydrostatic pressure which could build up under the canal lining in the wet areas, the contractor installed flap valves in the concrete lining. These will permit ground water from the outside to flow into the canal, but they will not permit water to leak out of the canal.

In all, the 13-mile project required 335,000 square yards of surface to be trimmed or prepared, and 28,000 cubic yards of concrete lining to be placed.

Structures

Wherever the canal's alignment intersected water courses, concrete pipe culverts were constructed under the canal. Where conditions dictated, monolithic concrete or welded steel pipe overchutes were constructed across the canal. Culverts were constructed between the grading and the trimming operations, and backfilling around the structures had to be done carefully and accurately to prevent future settlement that would rupture the canal lining.

Backfilling around drainage pipe requires careful work by this Allis-Chalmers HD-6 tractor with Tracto-Shovel at front and Ottawa compactor at the rear. The compactor is interchangeable with a backhoe attachment for small excavations. At left, a Hough HM Payloader moves in material.

For this operation, the grading contractor used a Hough Model HM Payloader and an Allis-Chalmers HD-6 with Tracto-Shovel and a rear-mounted Ottawa compactor. The compactor was interchangeable with a backhoe attachment that was used to dig some of the trenches. Backfill around the pipes was compacted with Ingersoll - Rand "jumping - jack" tampers powered by a Le Roi 125-cfm compressor. The tractors then placed the remainder of the backfill in thin layers, running back and forth over it to complete the compaction.

The construction of concrete bridges over the canal and a number of cast concrete structures was sublet to Spears Construction Co., Modesto, Calif. Several reinforced-concrete bridges were built to carry county roads across the canal. Other structures included control works and siphons to carry the canal under watercourses, highways, and railroads.

Spears set up a Winslow Binan-batch proportioning plant to supply transit mixers that hauled to the several pouring locations. This part of the work required 3,800 cubic yards of concrete.

To carry the canal under U. S. 40, the general contractor jacked 115 feet of 108-inch reinforced-concrete pipe under the 4-lane highway. As big hydraulic jacks forced the pipe sections ahead, the dirt was excavated from inside by hand and hauled out by a winch and bucket.

The contractor got a lucky break in getting a similar size of pipe under the track of the Sacramento Northern Railroad. The railroad was able to suspend operations over the line from a Friday afternoon until Sunday night, and this enabled the contractor to make an open cut and place the big pipe by working straight through the weekend.

After the lining was completed, the earth slopes were dressed smooth, and the permanent operating road was graded on the left berm and surfaced with gravel.

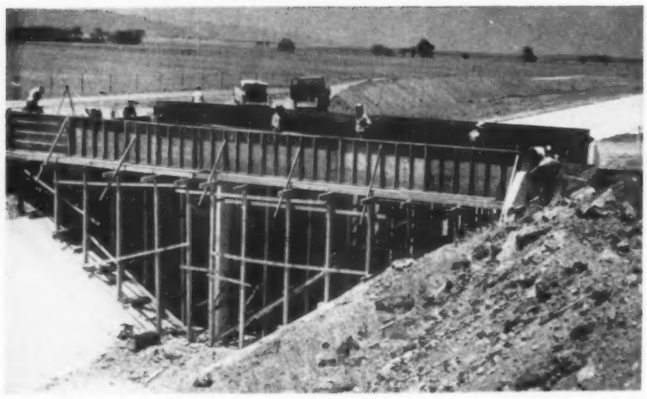
Several timber bridges, constructed across the canal to carry farm roads, were built under a subcontract by

CUTS HIGHWAY BUILDING COSTS

Dual-purpose A-W Roller-Compactor serves both as vibratory deep penetration type compactor and static weight roller type surface compactor for stone, gravel and soil subbases used in the construction of highways and runways. Shown in use on a highway relocation job near Harrisburg, the machine has been approved by Pennsylvania for complete compaction of stone base aggregates up to 10 in. thick on highway construction in that state.

For more facts, use Request Card at page 18 and circle No. 236

(*Continued from preceding page*)



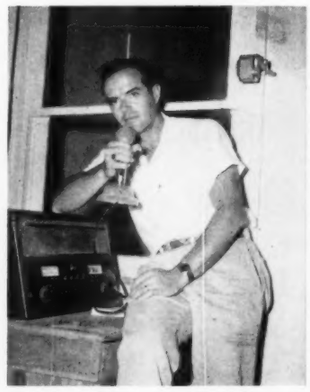
Bridges across the canal are built under a subcontract by Spears Construction Co., Modesto, Calif. Typical is this span, with center pier on a footing poured ahead of the tunnel lining. The reinforced-concrete slabs were cast in place.

Pitsker-Benton Associates, Monterey, Calif. The right-of-way was fenced by another subcontractor, San Jose Steel Co., San Jose, Calif.

The narrow right-of-way made it almost inevitable that some operations would encroach on adjoining farms. But most of the landowners were co-operative and, in turn, the contractor assisted them in maintaining their existing irrigation systems during construction, and in replacing them after the canal was complete.

Personnel

Heading the supervisory staff for Vinson Construction Co. was project engineer W. C. "Bill" Burns. Others on his staff were project engineer



Project manager W. C. "Bill" Burns uses an RCA mobile radio system to talk to one of his foremen at a distant location. Operations were spread over several miles at almost all times, making the radio very valuable.

J. H. "Jack" Martin, lining superintendent Fred Scales, general foreman E. W. "Pete" Beall, trim and rail foreman R. W. "Bob" Harper, excavation foreman Glen Kester, and office manager C. D. Johnson. The excavation work of Darkenwald Construction Co. was under the direction of Dick Smith. Structural work done by Spears Construction Co. was supervised by J. N. "Bob" Fadel.

Representing the U. S. Bureau of Reclamation on this contract was senior inspector H. B. Zimmerman. The project construction engineer for the Solano Project is B. P. Bellport. The resident engineer in charge of canals for the project is D. M. Wren. The office engineer is H. E. Horton.

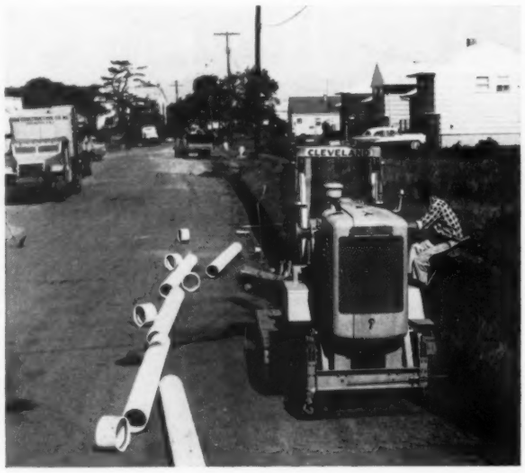
THE END

ARBA film aids engineers on federal road program

The American Road Builders' Association has released a 16-mm. sound, color film, "We'll Take the High Road", to aid engineers and highway officials connected with the federal highway program. The film points out ways engineers and officials can obtain cooperation and support of local citizens when relocations or acquisition of right-of-ways necessary in the Interstate System.

Copies of the film can be obtained from the American Road Builders' Association, World Center Bldg., Washington 6, D. C.

Trench digging with Cleveland cuts repaving costs 25%



ERN CONSTRUCTION CO's new Cleveland 110 Trencher cut repaving costs 25% on the installation of 11,000 feet of 12 and 8 inch pipe throughout East Brunswick Township near Springfield, New Jersey. Trench was 5½ feet deep and 24 inches wide. Foreman Henry Appleby says:

"We're able to reduce repaving costs 25% with the Cleveland because it cuts cleaner, narrower trench than the backhoe method we used previously."

"We get better production, too," says Appleby. "The Cleveland digs about 780 feet of trench per hour compared to about 100 to 150 feet with the backhoe."

Good Everywhere

The CLEVELAND TRENCHER Co.

20100 St. Clair Avenue • Cleveland 17, Ohio

For more facts, use Request Card at page 15 and circle No. 237

An artist's sketch shows the United Engineering Center, to be erected on United Nations Plaza between 47th and 48th Streets, New York City. The center will serve as headquarters for 16 national engineering societies.

New engineering center to house 16 societies

A $10 million United Engineering Center, planned for erection on United Nations Plaza between 47th and 48th Streets, New York, N. Y., will serve as the new headquarters for 16 national engineering societies with a membership of about one-quarter of a million engineers. The building, scheduled for occupancy in 1960, will replace the 50-year-old Engineering Societies Building at 29 West 39th St., now inadequate in view of the tremendous growth of technology.

The center will consist of a 20-story tower surrounded by lower structures with landscaped grounds. The 250,000 square feet of floor space will accommodate the Engineering Societies Library, an exhibition space, and an engineering Hall of Fame, in addition to the 16 societies.

The founder societies whose headquarters will be in the new building are: American Society of Civil Engineers, American Institute of Mining, Metallurgical, and Petroleum Engineers, The American Society of Mechanical Engineers, American Institute of Electrical Engineers, and American Institute of Chemical Engineers. Eleven associated societies will also have headquarters in the new building.

"The Map Makers" shows photogrammetry at work

"The Map Makers" is a new 16-mm. color-sound movie on the use of photogrammetry for mapping areas where highways, bridges, and other projects are to be built.

Tailored for showing to both technical persons and to laymen, the film shows how maps are prepared. Air crews of Spartan Air Services are shown taking off on a photo mission and bringing back a series of vertical stills of the terrain covered. The scene then shifts to the photo laboratory, where the film is processed, mosaics made, and negatives prepared on glass plates for use in Canadian Aero stereoplotters, the delicate instruments that turn out the finished map.

Prints of the film are available from the Public Relations Department, Spartan Air Services, Ltd., 74 Sparks St., Ottawa, Canada.

Goodyear to open plant

The Goodyear Tire & Rubber Co., Akron, Ohio, has built a new plant at Sacramento, Calif., for retreading and repairing off-the-road tires. Scheduled to open in April, 1958, the one-story building, with reinforced-concrete walls, is 246 feet long, 122 feet wide, and will have more than 30,000 square feet of floor space.

Film details construction of offshore platforms

"Three Legged Islands", a 16-mm. film showing the construction and operation of its offshore platforms, is now available from R. G. LeTourneau, Inc. The 18-minute, sound, color movie discusses the LeTourneau offshore platforms, in particular the Scorpion which set a time record for relocation activity in the Gulf of Mexico.

Also shown is the Vinegarroon, which weathered hurricane Audrey with virtually no damage, and three others during construction stages at Vicksburg, Miss.

The film is available to petroleum groups. Write R. G. LeTourneau, Inc., 2399 S. MacArthur, Longview, Texas.

Rough Going Doesn't Faze **Gorman-Rupp Lightweight Pumps**

Mud and frozen chunks of dirt won't stop this pump. It's a Gorman-Rupp "80" Series. Straight-in suction delivers liquid directly to the impeller's eye. No entrance restrictions. No check valve. Capacity, efficiency and suction lift are increased.

Gorman-Rupp "80" Series Centrifugal Pumps prime and reprime at lifts up to 30 feet. They are easily moved from location to location because of lightweight, aluminum construction. (The Midget weighs only 48 pounds.)

Available in four models:

Midget, 1½", 6,500 GPH, 2.25 HP
Pelican, 2", 8,500 GPH, 2.75 HP
Hawk, 2", 12,000 GPH, 5.5 HP
Eagle, 3", 18,000 GPH, 6.8 HP

Ask your Gorman-Rupp Distributor for a demonstration.

NEW PRIMING PRINCIPLE introduced at the Road Show

PUMP AT REST—Captured liquid retained for priming. Note absence of usual check valve.

PRIMING ACTION—Entrained air (B) escapes at (A) to be discharged. Priming liquid returns (C) to entrain more air.

PUMPING ACTION—Straight-in suction voids entrance restrictions. Water enters direct to the eye of the impeller.

THE GORMAN-RUPP COMPANY

305 Bowman Street • Mansfield, Ohio

For more facts, use Request Card at page 18 and circle No. 238

Getting big canal liner across busy highway is difficult moving job

The trimmer digging the Putah South Canal is reassembled in the ditch after a successful move across U. S. 40 near Vacaville, Calif. At this point the canal is carried under the highway by a 108-inch reinforced-concrete pipe jacked under the roadway.

Moving big canal trimming and lining machines into and out of the canals is always a painstaking and difficult job. But moving the two big machines across a busy 4-lane highway is an even tougher job.

This was the experience of the Vinson Construction Co. during work on the second reach of the Putah South Canal at Vacaville, Calif. (See "Big Machines Are Fast on Trimming, Lining Canal", pg. 48.)

Where the canal intersects U.S. 40, the two big machines had to come up out of the canal, cross the highway, and go back into the canal on the other side.

The fully assembled trimming machine is more than 57 feet wide, more than 20 feet high, and weighs about 45 tons. Supported on rails on the berm of the canal, it looks very stable. But standing on a trailer up out of the trench, it looks and is extremely top-heavy.

Before starting the move, the contractor removed the conveyors and some other units of the machine to reduce its weight to about 33 tons and cut down some on its height and width.

In the first step of the move, roads were graded into the canal on both sides so that a truck crane and the big moving trailer could get down beside the trimmer, side by side. On this move, a P&H 35-ton truck crane was rented from Dalzell Rigging Co., Emeryville, Calif., to make the heavy lift. Crowding up as close as possible to the trimmer, the crane picked it out of the canal and set it on the waiting trailer.

Maintaining its hold on the trimmer, the P&H crane walked out of the excavation, keeping beside the trailer, which was pulled out by Vinson's Lorain MC-504 motor crane. Between this point and the trench on the other side were a high-voltage power line and a busy 4-lane highway. Visualizing the top-heavy trimmer lying on its side in the middle of the highway was worry enough for the supervisors, but getting under the high-line added another problem.

Though the trimmer would have passed under the power line, the boom of the crane would not. And moving the trimmer even a few feet without the guiding support of a crane was too dangerous to try. A second crane, the Lorain, was used.

With a Cat No. 12 motor grader pulling the trailer, and the P&H crane holding the trimmer, the rig was advanced until the trimmer was partly under the wires. The caravan was halted before the crane boom got

Rising costs . . . shrinking profits . . .
can you beat the profit squeeze?

Like most everything else, equipment costs have gone up and are still rising. The U. S. Bureau of Labor Statistics price index for construction machinery rose 6.7% over a year ago—and that figure doesn't include the recent price increases averaging 7% by equipment manufacturers.

But highway bid prices have held the line in the face of these higher equipment and labor costs. According to the composite mile bid price index of the U. S. Dept. of Commerce, there's been an increase of only one-tenth of one percent in the past year. Common excavation bid prices were up only 1.5% in the same period.

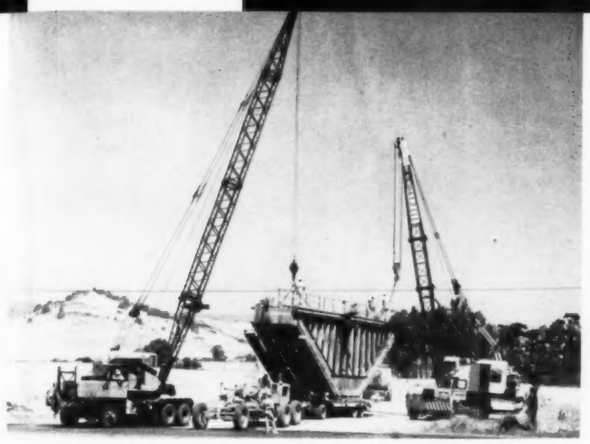
Costs Up . . . Profits Down

The obvious result of these higher costs, with bid prices remaining almost constant, is a real squeeze on the profit margin. It's probably the biggest factor in the 22% increase of business failures among contractors over last year. Net profits shrink fast under these conditions unless men and machines produce more. How to get this increase in production is the problem facing most dirtmoving contractors.

What's the answer?

With competition keeping bid prices almost constant, and with equipment and labor costs going up, modern earthmoving machines are the best bet to protect profits. Careful cost analysis may show that a partial replacement of your equipment—using a more efficient tractor for push loading scrapers, as an example,—would pay off in more yardage. Or your study may show that a change-over to other sizes or types of equipment would improve profits by a good margin.

The "Twin" Scraper has unequalled work-ability . . . works efficiently as a one-man earthmoving spread because it self-loads and can handle a wide range of assignments.



The lining machine is moved the next day. Balanced on a trailer, it is held upright by a Lorain MC-504, left and a P&H 35-ton crane, right, as it is inched under a power line.

Once the liner was under the power line, the P&H had to lower its boom, move under the power line, and make a hookup at the center of the rig. A line has been run from the Lorain to the Cat motor grader to help pull the load across the highway while the P&H keeps the rig upright. The move caused a delay of only 5 minutes to heavy traffic on the road.

dangerously close to the wires. Then the Lorain crane moved to the opposite side of the power line and took hold of the end of the trimmer which had passed under the wires.

This gave the P&H a chance to drop its center hold on the trimmer and move to the far end. With both cranes holding, the caravan moved ahead a few feet more. Then the P&H lowered its boom, ducked under the power line, and resumed its original position at the center of the trimmer. The first obstacle was overcome.

In order to hold traffic up as little as possible, the contractor took no chances on the motor grader's ability to pull the heavy load across the center island of the highway. The Lorain crane was driven across the highway. Then with six flagmen holding back the traffic, a line was run from the crane to the motor grader. With help from the crane, the grader pulled the heavy trailer across the road without hesitation, and the P&H crane moved across with it, balancing the trimmer on the trailer.

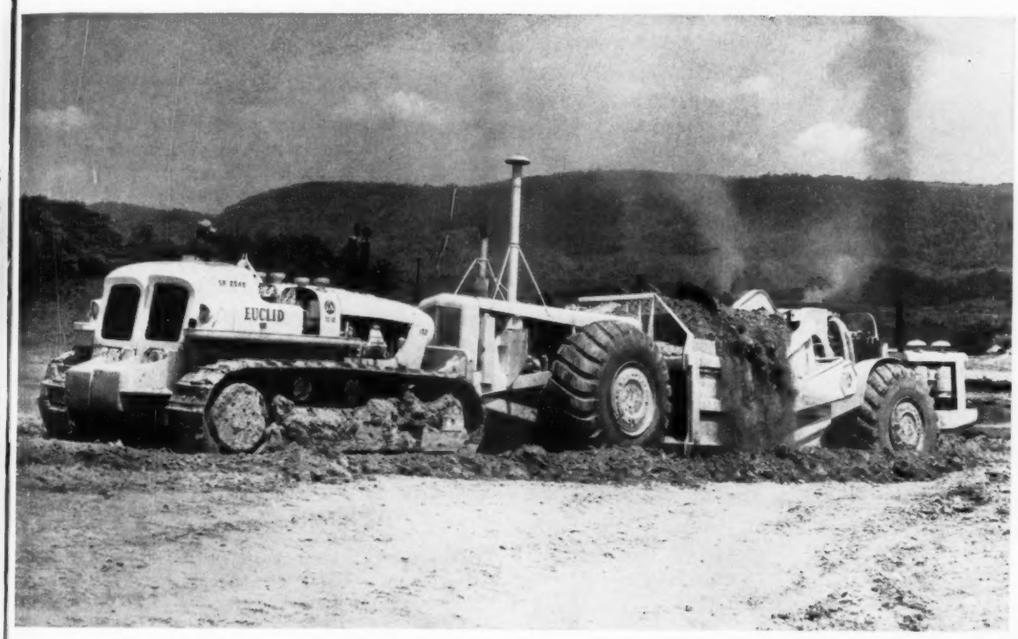
Once across the highway, the trailer and the P&H crane were backed down a ramp into the new ditch, and the crane set the trimmer back on its rails. Both cranes then cooperated in the work of reassembling the trimmer parts that had been stripped for the move. In a day, the trimmer was back at work.

The following day, the contractor went through the same operation with the lining machine. This rig was a little lighter, weighing about 25 tons stripped, but its dimensions were nearly the same. The contractor used the identical method to snake the machine across the roadway without incident and with a maximum delay of less than 5 minutes to traffic using the highway. Even in that time, a double line of cars stretched back as far as the highway could be seen in both directions. THE END

Thruway section opens

The final 29 miles of the Erie section of the New York State Thruway, from Silver Creek to Buffalo, is now open to traffic. Completion of the entire 70-mile Erie section will make it the longest toll expressway.

←For more facts, circle No. 239



On big yardage, high production jobs the "Twin" team of Euclid TS-24 Scraper and TC-12 Crawler moves dirt faster and cheaper than any other combination of equipment—under good conditions or on the toughest going you've ever seen.

For instance . . .

Let's assume you're using a spread of three 18 yd. scrapers push loaded by a 200 h.p. tractor . . . job management is excellent and operating conditions on all phases of the project are good . . . but you bid close and your profit margin is pretty thin. To move more yardage you consider using a bigger tractor to get better loading performance with these three scrapers. One manufacturer has pointed out that this larger crawler could boost production by 20% and effect a 12½% reduction in cost per yard. That's certainly a big improvement in your profit picture.

But suppose you want to obtain the maximum profit potential from your job . . . you consider another possibility . . . the use of Euclid "Twins" in place of your original equipment spread. Again assuming the same job conditions, here's what the production and cost figures would show. With 2 Model TS-24 Twin-Power Scrapers and a TC-12 "Euc" Crawler, you'd get 45% more yardage than you would with the spread of 3 scrapers and 200 h.p. tractor . . . and you'd save 23% in your cost per yard. If job conditions were really tough, the return on investment would be even greater. It's earning power like this that has helped contractors with "Twins" beat the profit squeeze on all kinds of work.

On the Highway Program

Euclid Twin Scrapers and Crawlers are moving the cheapest dirt in all parts of the country. On the Illinois Toll Road, for example, 8 contractors are using a total of 50 "Twins" and many of these 24 yd. "Eucs" work under adverse conditions that stall other scrapers. More and more contractors are finding Euclid "Twins" have more earning power than any other equipment. If you haven't checked the facts and figures, have a Euclid Dealer show you why "Twins" give you a bidding advantage and are your best investment.

Engineered to fit the job . . .
Euclids are your best investment

GM GENERAL MOTORS EUCLID

EUCLID DIVISION
General Motors Corporation
Cleveland 17, Ohio

The Beavers honor nine for service to construction

Four of the nine men given Golden Beaver awards for distinguished careers in construction are, left to right, J. C. Maguire, head of J. C. Maguire Construction Co., Butte, Mont.; R. M. Conner, veteran construction superintendent for Morrison-Knudsen Co., Boise, Idaho; H. E. Hedger, chief engineer of the Los Angeles Flood Control District; and R. G. LeTourneau, construction-machinery designer, developer, and manufacturer.

Golden Beaver awards for distinguished work in heavy construction were presented to nine men at last month's third annual awards dinner held by the Beavers in the Biltmore Hotel, Los Angeles.

The organization, primarily an honorary group, draws its membership from engineering and heavy-construction firms active west of the Mississippi River, and from firms in the Pacific area.

Awards for management went to John C. Maguire and Lester S. Corey, and awards for supervision went to Ralph M. Conner and A. E. Graham. Ross White and Harold E. Hedger were presented with awards for engineering, and R. G. LeTourneau and Guy C. Kiddoo were given awards for supply. A special award went to L. N. McClellan.

Each of the men given awards for management has chalked up more than 50 years' service in construction. Maguire started as a partner in the Strange & Maguire firm at Salt Lake City in 1907, and in 1913 started his own firm, J. C. Maguire Construction Co., in Butte, Mont. A number of joint-venture jobs on dams followed before the firm moved to Los Angeles and Maguire became co-sponsor on Shasta Dam.

Corey's 53 years in construction were spent entirely with Utah Construction Co., Salt Lake City. Starting as timekeeper, he worked his way up to become president of the firm.

Conner's half century of service includes work with the U. S. Bureau of Reclamation and service as construction superintendent on such projects as the Don Martin job in Mexico, the Madden Dam in Panama, and the Imperial Dam.

Graham, another one-firm man, started with Pacific Bridge Co. in Portland in 1913, and moved with the firm to San Francisco. He lists to his credit work on bridges, underwater pipelines, graving docks, and naval facilities.

White's entry into heavy construction was made as a cub construction engineer in the Philippines. Since 1942, he has been vice president of Brown & Root, Inc., Houston, Texas.

Hedger, chief engineer of the Los Angeles Flood Control District, has been working for the district—with time out for military service—since 1924. He is at present the administrator of the $179 million storm drain bond issue program for Los Angeles County.

R. G. LeTourneau, a leader in the design and development of heavy-construction machinery for more than 30 years, has recently turned his attention to equipment for handling heavy materials, off-shore drilling, and land clearing.

Kiddoo prefaced his work with construction firms by becoming a lawyer and an officer of a mercantile firm. Now serving as general vice president of the First National Bank of Chicago, Kiddoo has assumed a leading position among the country's bankers in extending credit for construction work.

McClellan, chief engineer of the USBR, started with the bureau as junior engineer and assistant engineer on the design, construction, and operation of power systems.

Barge Mounted Wiley Whirley cranes at work on the Harlem River on a 1300 lineal foot bulkhead job.

WILEY... for dependable ENGINEERING & WORKMANSHIP...

A SUBSIDIARY OF RIC REPUBLIC INDUSTRIAL CORPORATION

George W. Rogers, president of the George W. Rogers Construction Company, thinks very highly of the full revolving steam Wiley Whirleys shown above. He said they are ideal for his heavy construction work because "They are fast and hefty . . . and the maintenance is very nominal indeed."

Mr. Rogers said that the best indication of his feeling about these cranes is the fact that they have another one on order.

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Port Deposit, Md

Write for free 38-page illustrated brochure, showing Wiley cranes, barges, tugs, etc., on the job.

For more facts, use Request Card at page 18 and circle No. 240

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big news about
the most advanced
off-the-road tire
on the market today!

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B.F.Goodrich

NEW ROCK SERVICE TUBELESS PREVENTS UNNECESSARY TIRE FAILURES

THE new B.F.Goodrich Rock Service Tubeless tire for mining, quarrying and dirt-moving jobs eliminates the major cause of tire trouble and expense! Unlike ordinary tires, the Rock Service is *built to its inflated shape.* This FLEX-RITE construction permits *even* flexing. No localized stresses that often cause unnecessary tire failures.

The Rock Service is built with FLEX-RITE NYLON cords that withstand double the impact of ordinary cord materials, resist heat blowouts and flex breaks. Result: more retreadable Rock Service tires. Double-chevron cleats give maximum traction and skid resistance in forward or reverse. Sidewalls defy bruises, grooves expel stones.

B.F.Goodrich Tubeless construction runs cooler, protects against punctures, cuts maintenance costs, is easier to service.

See the Rock Service Tubeless (or tube-type)—the most advanced off-the-road tire on the market today—at your B.F.Goodrich dealer's. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

No unnecessary failures thanks to bruise-resistant tread and sidewalls, uniform flexing, cooler-running tubeless construction.

Greater traction—the double-chevron tread digs in and pulls in forward or reverse. Sharp cleat angles defy dangerous skids.

FLEX-RITE construction means the Rock Service is not distorted when inflated. No tire-killing stresses. Instead, uniform flexing.

More retreads, because FLEX-RITE NYLON cords withstand double the impact of other materials, resist heat blowouts, flex breaks.

Specify **B.F.Goodrich tires when ordering new equipment**

Smileage

Your B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book

Design in "counterpoint"

—a revolutionary design is being used for construction of a new bridge across the Rhine River at Cologne

A revolutionary design in suspension bridges is that for the span across the Rhine River at Cologne, Germany.

This "counterpoint" design uses a single triangular steel tower, rising 200 feet from its foundation in the river, and carrying three pairs of cables that flare out and tie to the 2,300-foot bridge at equidistant points on either side.

A number of factors influenced the choice of the design, which was developed by Gutehoffnumgshutte Sterkrade A. C., of Oberhausen-Sterkrade. There was some question as to the soundness of the subsoil on either bank, but this problem was solved by setting the tower in suitable caissons in the river, off to one side of the much-traveled channel. Also, according to engineers, there is less deflection with the single tower. The bridge cables bear on a single point at the apex of the triangular tower, making them better able to resist torsional loads resulting from one-sided loading of the bridge.

Another important reason for the design is that Cologne is an important cathedral city, and a minimum of skyline obstruction was desired. Ironically, the span is so unconventional that it will draw attention to itself and away from the towering spires of the cathedral. It will do more; completion of the structure will provide a sharp contrast between the old and the new in present-day Cologne.

Cables stretch a maximum of 500 feet from the tower, and on one side reach the midpoint of the 990-foot-long span over the river.

Altogether, there is a total of 9,250 tons of structural steel, cables, rollers, deck plates, trim, and other detail. Much of this is being arc-welded, both by the automatic submerged-arc process and by manual field erection techniques.

The 62.3-foot roadway and the sidewalks, which together give the deck a width of about 75 feet, are given main support by heavy, welded box beams, with both longitudinal and cross supports. They were prefabricated in 49-foot lengths, and the sections were riveted together at the site. Most of this welding was done by automatic methods. These large box beams also provide a means of carrying power, telephone, and other cables across the river, while concealing them.

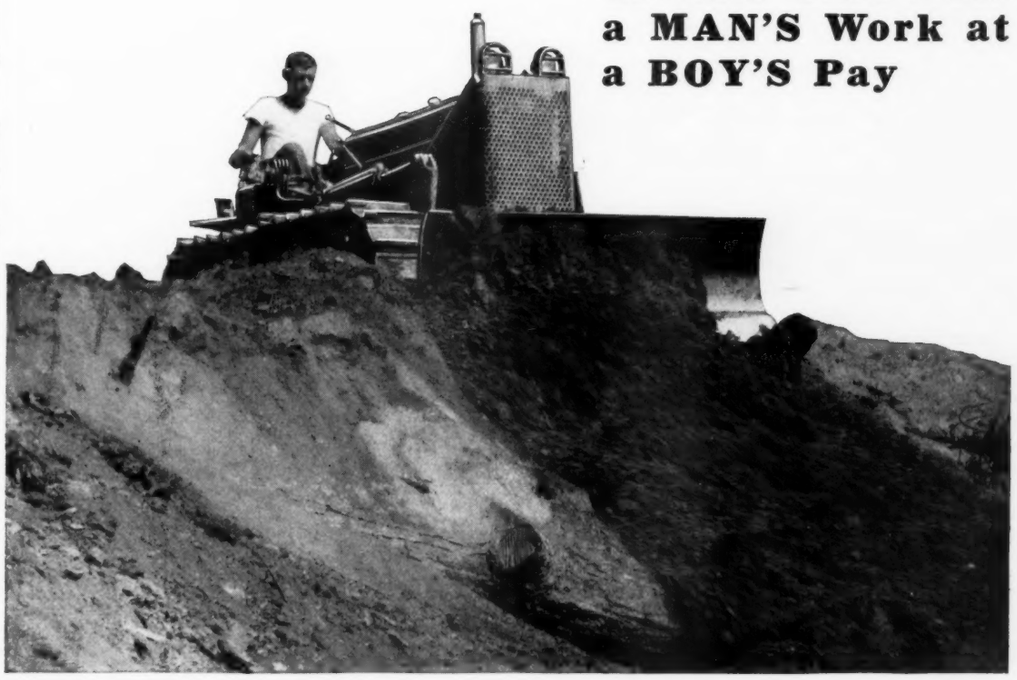
The roadway is built up of deck plates, 49 feet long, 19.7 feet wide, and 0.39 inch thick, which were welded together automatically. Under this is a supporting system of crossbeams, spaced about 1.2 inches apart. This system was welded manually. A layer of aluminum foil, glued to the deck-plate assembly, will be topped with a 2-inch-thick course of hot-mix.

THE END

A drawing of the new suspension bridge across the Rhine River at Cologne, Germany, superimposed on a photograph, shows the triangular tower rising 200 feet from its foundation. The 990-foot-long suspension section is supported by cables with a maximum reach of 500 feet.

IT'S A JOHN DEERE!

. . . the Ruggedly Built Crawler That Does a MAN'S Work at a BOY'S Pay



WHEN you're figuring costs, how many times have you wished for a rugged, compact, inexpensive power unit that would turn in a really BIG day's work at costs far below tractors you may now be using?

Very likely, the John Deere Crawler is exactly what you've been wanting.

First, make no mistake about its ability to do a man-sized job. On contracting jobs of all kinds, on materials-handling work, you simply have to *see* the amount of work—and the quality of work—this high-torque, sure-footed crawler is turning out.

Here is rugged power to push or pull unbelievable loads; power to replace bigger, more costly tractors on many jobs.

Here is a tractor with multi-purpose equipment so adaptable there is almost no end to its uses . . . a tractor that's easy to transport, easy to handle, comfortable to ride, a compact, highly maneuverable tractor that gets in and out of tight places.

Best of all, it is economical any way you look at it. Initial cost? The investment is well within the range of the small-scale home-builder. A set of tracks for some tractors costs more than a complete "420" Crawler. Daily fuel costs? Fill the 10-1/2-gallon gas tank and you're all set for a full day's work. Maintenance? The name John Deere assures you the high quality of materials and workmanship that has been traditional with John Deere products for more than 120 years.

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For more facts, use coupon, or Request Card at page 18 and circle No. 242

Names in the news

Joel H. Morris, assistant to the president of F. H. McGraw & Co.

F. H. McGraw names Morris assistant to president

Joel H. Morris has been named assistant to the president of F. H. McGraw & Co., New York, N. Y. The former chief engineer will take over additional administrative duties in the engineering department and in other phases of the company's operations.

As chief engineer of the firm, Morris has been in charge of engineering a number of important industrial projects, including a high energy fuel plant. He has served as consultant to industry and government, and is a member of the executive reserve of the Office of Minerals Mobilization for the Department of Interior.

McGraw Industries, the Hartford, Conn., equipment subsidiary of F. H. McGraw & Co., New York, N. Y., has named Roy Longstreet, of the Chicago staff, treasurer of the firm, and promoted J. W. Meacham to general manager. The appointments follow the resignation of George O'Connell, now president and general manager of Shawmut Equipment Co., Manchester, Conn.

Sullivan awarded bi-state medal

Thomas M. Sullivan, chief of the Aviation Planning Division of the Port of New York Authority, has been awarded the bi-state agency's Distinguished Service Medal, for his role in planning the $150 million Terminal City at New York International Airport.

Sullivan, who has been aviation planning chief in the Port Authority's aviation department since 1953, is responsible for the functional planning and coordination of construction on all airport and heliport facilities of the bi-state agency.

ASCE announces awards

The American Society of Civil Engineers has announced the award of a Research Prize to three men, for outstanding achievements: Dr. Mikael P. J. B. Hvorslev, consultant to the Waterways Experiment Station of the U. S. Corps of Engineers at Vicksburg, Miss.; Dr. Bruce Johnston, of the Department of Civil Engineering, University of Michigan at Ann Arbor; and Dr. Lorenz G. Straub, director of the St. Anthony Falls Hydraulic Laboratory and head of the Department of Civil Engineering, University of Minnesota, Minneapolis.

Foundation Co. elects Ilgenfritz director

Carl A. Ilgenfritz, vice president and director of the United States Steel Corp., has been elected a director of The Foundation Co., New York, N. Y., succeeding the late James D. Mooney.

Ilgenfritz has also been vice president in charge of purchases for the Carnegie-Illinois Steel Corp., a U. S. Steel subsidiary, and held the same post for U. S. Steel Corp. of Delaware. In 1951, he was made vice president of purchases and a director of U. S. Steel Corp.

Capt. Peter Corradi, deputy chief of the Navy Bureau of Yards and Docks.

Capt. Corradi named deputy chief of BuDocks

Capt. Peter Corradi has been made deputy chief of the Navy Bureau of Yards and Docks, relieving Rear Adm. Albert J. Fay, who has been made district civil engineer and public works officer for the Fifth Naval District at Norfolk, Va.

Capt. Corradi, formerly district public works officer for the Sixth Naval District in Charleston, S. C., served in the Bureau of Yards and Docks eight years ago. At that time he was manager of the utilities branch. He became director of the project management division, and later executive assistant to the assistant chief for construction.

He is a member of American Society of Civil Engineers, the Society of American Military Engineers, and the National Society of Professional Engineers.

"FINEST PERFORMANCE FOR 56 YEARS! WE'LL STAY WITH STANDARD"

ON-THE-SPOT *technical service,*
products that never fail
keep Palumbo Excavating Company buying STANDARD
FUELS *and* LUBRICANTS

The newly elected officers for the Power Crane and Shovel Association are, left to right, Frederick Salditt, vice president; Arnold R. Corbett, president; M. B. Garber, retiring president; and Herbert S. Blake, Jr., secretary and counsel.

Crane and shovel group elect 1958 officers

The Power Crane and Shovel Association elected its 1958 officers at the annual meeting. Arnold R. Corbett of Unit Crane & Shovel Corp., is the new president; and Frederick Salditt of Harnischfeger Corp., vice president. Herbert S. Blake, Jr., continues as secretary and counsel.

The 12-year-old association works for the interests of shovel manufacturers and the construction industry. At present it is working in conjunction with the Department of Commerce in revising the commercial standard for power cranes and shovels. The revision is expected to be complete early this month.

M-C&S appoints Elwell

Frank A. Elwell has been appointed director of insurance for Merritt-Chapman & Scott Corp., New York, N. Y. The former insurance manager of the company's construction department is now responsible for risk management and coordination of all insurance coverage by M-C&S operating departments.

Edwin R. Akers, president of the Frederick Snare Corp., New York City.

Frederick Snare Corp. elects Akers president

Edwin R. Akers has been elected president of the Frederick Snare Corp., New York City, succeeding George P. Seeley, who has been elected assistant to Arthur W. Buttenheim, chairman of the board. John F. Myslik, formerly assistant secretary and treasurer, is now secretary and treasurer, replacing Harry O. Ware, who retired.

Akers, during his thirty-eight years with the corporation served as senior vice president, and has been actively connected with the firm's engineering operations in the United States and Latin American countries.

Leon L. Munier, president of the Building Industry Employers of New York State.

Munier elected new president of B. I. E.

Leon L. Munier has been elected president of the Building Industry Employers of New York State, succeeding Merton S. Marshall of the Walter S. Johnson Building Co., Niagara Falls. Munier is president of Wolff & Munier, New York City, a firm of mechanical contractors.

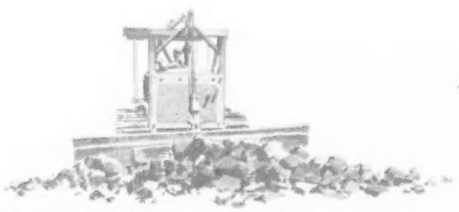
Other officers elected are William E. Bouley of W. E. Bouley Co., Inc., Auburn, N. Y., first vice president; Frank N. Smith of Smith, Langhans & McLaughlin Construction Corp., Corning, N. Y., second vice president. Edward C. Frick of Albany, N. Y., was re-elected as secretary-treasurer.

Chicago Bridge transfers

Three members of Chicago Bridge & Iron Co., Chicago, Ill., have been transferred in the sales department. Arthur R. Simpson, a member of the general sales staff since 1945, is now in the Chicago sales office. Transferred from the Birmingham office to the Houston sales office is James R. Mansell; and George M. Rowley has been moved from the Hillside, N. J., erection district to the Boston sales office.

Chairman of the board of New York Trap Rock dies

Wilson Perkins Foss, Jr., 66, chairman of the board of the New York Trap Rock Corp., West Nyack, N. Y., for the past 27 years, recently died at Memorial Hospital, New York City. Foss' father was one of the founders of Conklin & Foss, Inc., forerunner of New York Trap Rock Corp.



In 1901 Joseph Palumbo found that Standard Oil lubricants worked best to keep the horsedrawn wagons rolling smoothly. Later, in 1920, his son Samuel Palumbo founded Palumbo Excavating Company. For 56 years Standard Oil Company has satisfied the company's every petroleum need.

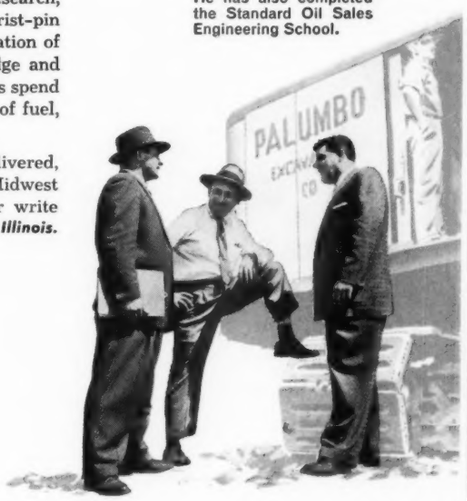
Peter A. Palumbo, general manager of the company and grandson of its founder, tells why: "Standard's products are superior. The service is 100 per cent . . . anywhere we have a job. We've never experienced delays from Standard Oil; I have confidence in the name Standard."

For instance, on the project pictured on this page, as on all its jobs, Palumbo has found that Standard provides the right combination to keep equipment constantly on the job: STANOLUBE HD-M Motor Oil and the technical know-how supplied by Standard Oil automotive lubrication specialists.

STANOLUBE HD-M gives superior service under grueling conditions. It is refined from highest-quality base stock. As a result of Standard Oil research, STANOLUBE HD-M is formulated with an additive that prevents bronze wrist-pin bushing corrosion. Other additives retard oil oxidation, minimize formation of piston ring deposits, prevent formation of excessive varnish and sludge and prevent corrosive attack on bearing metals. Standard's trained specialists spend hours on the job site to make sure equipment is never down for lack of fuel, lubrication or service.

This dependable combination—highest-quality products, promptly delivered, and skilled technical service—can be yours, too, anywhere in the 15 Midwest or Rocky Mountain states. Call your nearest Standard Oil office. Or write *Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.*

Putting Expressways Together. Excavating for interchange joining three major Chicago-area expressways, the Palumbo Company is moving 472,000 cubic yards of earth. Here are Peter A. Palumbo, John L. Bugatto of Standard Oil and Charles Bohac, general superintendent for Palumbo. John prepared for the technical advice he gives on jobs like this by obtaining an engineering degree at the University of Illinois. He has also completed the Standard Oil Sales Engineering School.



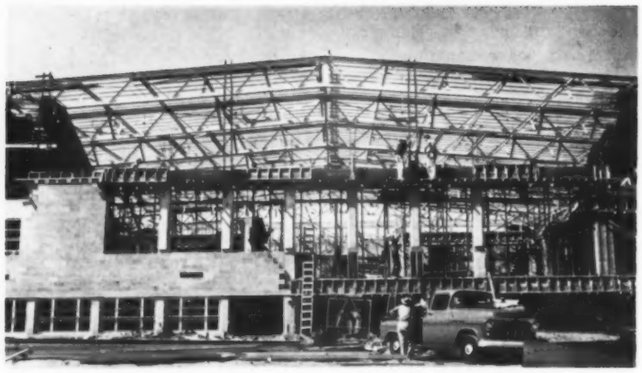
Quick facts about
STANOLUBE HD-M Motor Oil

- Refined from highest-quality, solvent-extracted base stocks.
- Contains special additives that prevent bearing and bronze wrist-pin bushing corrosion, reduce piston varnish and keep rings free to seal against blow-by.
- Contains still other additives that reduce wear on heavily stressed parts.

YOU EXPECT MORE FROM STANDARD AND GET IT!

Motor-minded Palumbos: Fourth generation. Joey and Sam, Peter Palumbo's sons, riding in their motor-driven car, hand-built by their dad. In background is one of the company's heavy-duty trucks used at the expressway project. Standard Oil fuels and lubricants keep the Palumbo equipment dependably on the go.

←For more facts, circle No. 243



The end wall section immediately behind the truck had been left open for cranes to enter and erect the 193-foot roof trusses spanning the main gym. The reinforced-concrete frame of this part of the building is now being formed.

Cranes and belts hoist materials for big gym

Sloping bleacher sections complicate forming and shoring on $2.5 million structure for University of New Mexico

Constructing a $2.5 million building without using a tower or hoist was the somewhat unusual experience of general contractor Lembke-Clough & King, Inc., Albuquerque, N. Mex. The contractor started work on the gymnasium building for the University of New Mexico, Albuquerque, in mid-February, 1956, and completed it just in time for the fall term of 1957.

Even though most of the structure was high enough to warrant the use of a tower elevator, the sloping concrete bleacher sections all around the gym, together with offset floor levels, made the use of a conventional tower impractical. Therefore, everything from form lumber to finished interior masonry was hoisted to the higher levels by cranes or by inclined belt conveyors.

The big new gym, done in the Southwest pueblo architectural style which is traditional on the UNM campus, contains all of the school's indoor physical education facilities. In addition to the large main arena gymnasium, there is an auxiliary gym, a combat gym, swimming pool, handball courts, shower and locker rooms, team rooms, equipment rooms, training rooms, plus offices and facilities for the physical education staff.

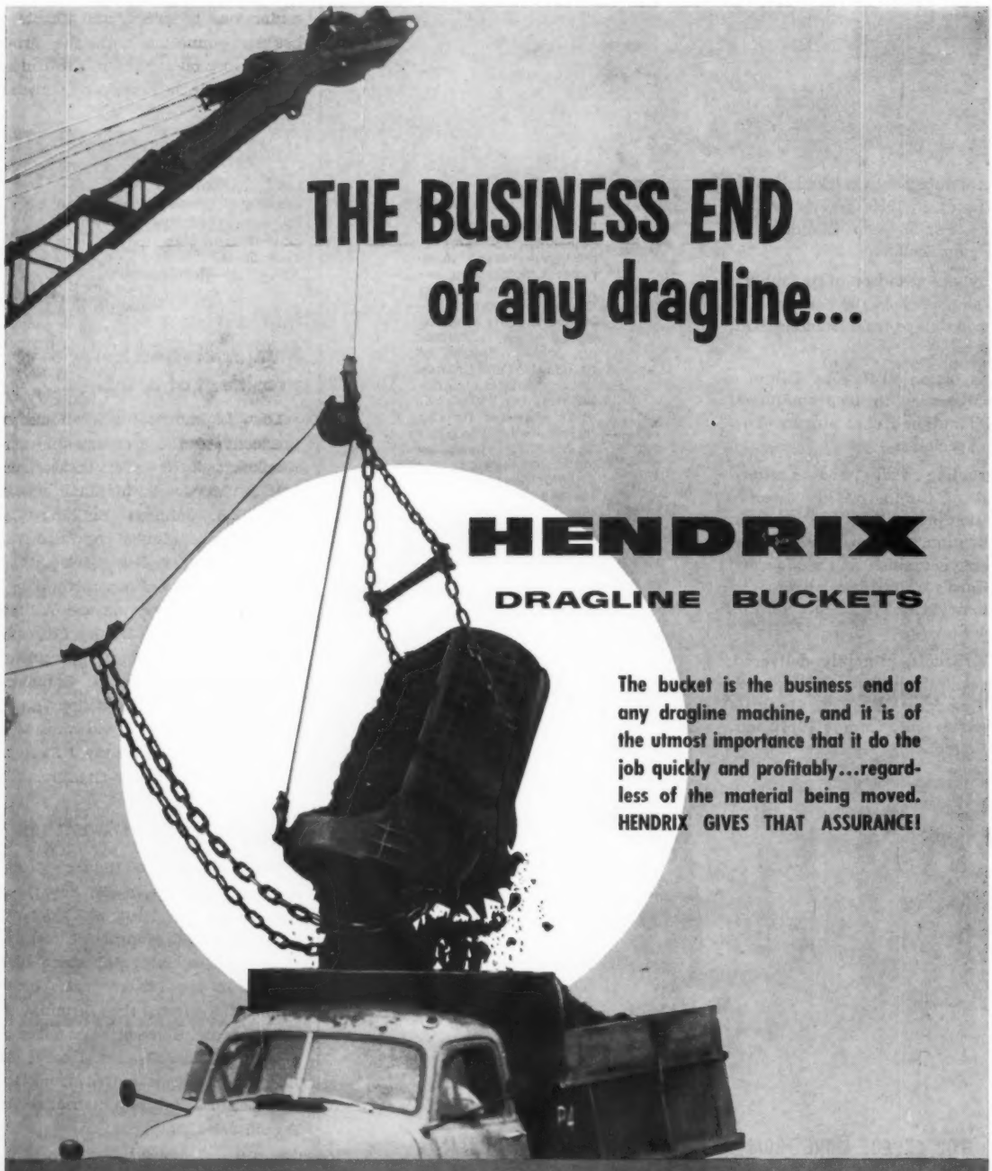
Most of the building is of reinforced-concrete frame construction with masonry walls and an exterior of stucco and painted concrete panels. The main arena roof is supported on 193-foot-span welded steel trusses with fiber plank roofing supported on bulb tees on the purlins. The roof is prefinished on the inside, and the painted steel will remain exposed. A built-up roof completes the structure.

The gymnasium building was designed by Meem, Zehner, Holien & Associates, architects, of Albuquerque. The architects also supervised construction.

Grading, excavation

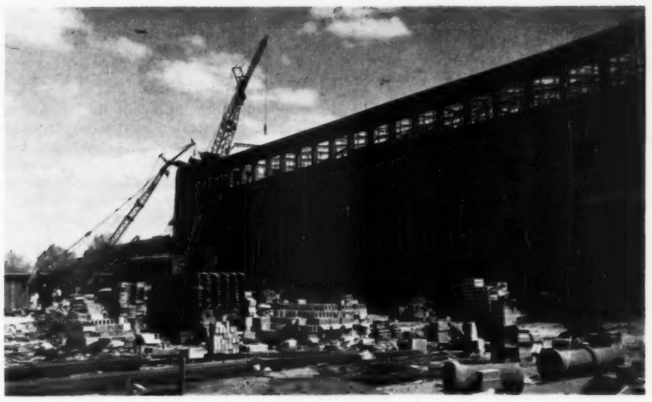
Grading of the site and excavation of the basement were done by Caldwell Trenching Co., Albuquerque. Using a spread of rubber-tire scrapers together with tractors and dozers. the firm first graded the site and scooped out the main basement area. Deeper excavations for tunnels and for basements in the corner areas of the building were dug with dozers and tractor shovels.

The structure is founded on spread footings which were first formed and then poured directly from transit-


THE BUSINESS END
of any dragline...
HENDRIX
DRAGLINE BUCKETS
The bucket is the business end of any dragline machine, and it is of the utmost importance that it do the job quickly and profitably...regardless of the material being moved. HENDRIX GIVES THAT ASSURANCE!
"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid
HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA
Hendrix
Lightweight
DRAGLINE
BUCKETS

For more facts, use Request Card at page 18 and circle No. 244

Workmen are building forms for a section of the gym balcony. The forms in this area are supported by Acrow shores having special wedges on top to correct for the slope.



A Bucyrus-Erie 22-B truck crane with 100-foot boom and 30-foot jib sets some of the last steel for the roof of the gym, as another crane, background, handles form materials. The scaffolding covering this side of the building had been used by workmen building the wall.

mix trucks. Forms for the reinforced-concrete structure were faced with ¾-inch Plyform backed with 2×4 frames and double 2×4 wales. Columns were tied with Symons column clamps, and beam and wall forms were tied with Dayton snap ties. Beam and slab forms were shored with Acrow adjustable steel shores.

The 8,000 cubic yards of concrete required for the building were supplied by the Albuquerque Sand & Gravel Co. When possible, the concrete was placed directly from the transit mixers, but all concrete above the ground floor had to be placed with crane and buckets. Most of the concrete was placed by a truck crane using a Miller & Smith ½-yard concrete bucket. This crane was fitted with a 75-foot boom and a 15-foot jib. Another crane used on the job was a Bucyrus-Erie 22-B truck crane with a 100-foot boom and 30-foot jib.

The cranes were especially busy on this job, because they had to raise practically every bit of material to the higher levels. The ability of the motor cranes to move quickly from one area to another made it possible for them to do the many small lifting jobs around the big building. The stability of truck cranes with outriggers in place proved extremely valuable on the heavy lifts and long reaches.

Sloping bleacher forms

The 150×106-foot main arena floor is completely surrounded by sloping seating or bleacher sections. Not only are these sections inclined to the horizontal, but the corner sections are also set at an angle to give a rounding or bowl effect. This, of course, resulted in many odd-shaped sections that were especially complicated to form.

On these sections, special wedge-shaped blocks were first set on the Acrow shores to provide footing at a proper slope for the double 2×4 stringers which supported the 2×4 form joists. These forms were decked with ¾-inch Plyform. The upper surface was formed in a series of steps to accommodate the seating equipment.

Steel erection

The steel trusses and roof framing for the arena were supplied by Midwest Steel & Iron Works Co., Denver, Colo., and erected by Huey Long of

(*Continued on next page*)

PUMPING 127′ VERTICALLY AND 250′ AWAY to drain 127′ deep x 100′ diameter riverside excavation for sewer pumping station. Pump is a Jaeger 10″ diesel. Above it, a Jaeger 6″ pump drains collector ring for the sheet-piled upper half of the hole.

135 LB. DIAPHRAGM PUMP PUTS OUT 4300 GPH: Often, an inexpensive 2″ or 2½″ suction hose is all you need with this powerful yet light weight aluminum 3″ pump. Has patented self-cleaning, shockproof spring-bottom bowl. 4″ model pumps up to 7500 gph.

CAN PUMP 1720 GPM AT ONLY 1450 RPM: This Jaeger 6P is the only 6″ pump that can move over 100,000 gallons an hour at a fuel-saving speed of only 1450 rpm. Holds prime, too, for pumping seepage after excavations have been dewatered.

ENOUGH PRESSURE FOR 3 JOBS: This Jaeger 6CPH jetting pump is simultaneously supplying two jetting rigs and a steam boiler, putting in 50′ timber piles for filtration plant. Jaeger builds the pressure pumps you want, sizes 2″ to 6″, pressures to 300 psi.

Jaeger pumps are oversize; give oversize performance

You're repaid for knowing pumps when you buy a Jaeger "Sure Prime". You get a bigger shell and impeller, an engine of the largest horsepower applicable, a positively lubricated seal that seems to last forever, and two independent, simultaneous priming actions. Result—doubly-sure fast priming under all conditions, bigger capacity at slower operating speeds, sustained efficiency and longest life from both pump and engine.

Base your pump buying on up-to-date performance data. See your Jaeger distributor or write for guaranteed actual performance of latest model Jaeger pumps in 1½″ to 10″ sizes.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • CONCRETE MIXERS • TRUCK MIXERS • PAVING FINISHERS • SPREADERS

For more facts, use Request Card at page 18 and circle No. 245

(Continued from preceding page)

A Sam Mulkey elevator carries masonry materials to the roof of a low section of the building. All hoisting was done by these elevators and several cranes, since the sloping sections and offset floors made it impracticable to use the conventional elevator.

Albuquerque. The 193-foot-long trusses were delivered to the site in five pieces. Three of these sections were assembled and welded together on the arena floor, prior to erection.

Three cranes then set the first two trusses, one of the cranes holding the erected sections while the other two did the actual lifting. After the first two trusses were set and braced, only two cranes were required for the remainder of the work.

There was only a very limited clearance between the outer knee sections of the trusses and the concrete building wall behind them. This necessitated extreme care in setting the center sections of the trusses. The sections were first bolted together with temporary field connections and then welded. The finished welded trusses have no bolts or rivets showing and present very clean, attractive lines. These trusses will remain exposed inside the arena.

Most of the building walls are of concrete block, with large amounts of brick and glazed tile going into the interior. Edward Franklin of Albuquerque, the masonry contractor, used a series of Sam Mulkey conveyor elevators to raise the masonry units to the upper floor levels. Target masonry saws did the necessary cutting and trimming.

A large amount of terrazzo is used in the building floors, especially in the corridors and entrance ways which are expected to be used by large groups of people. The terrazzo floor just inside the main entrance contains a beautiful inlay of the university emblem in full color.

Personnel

Supervising the project for the contractor was veteran superintendent M. "Scotty" Borthwick. Carpenter foremen were Tom McCorkle and Harold V. Noble. Labor foreman was Ramon Sisnores. Representing the architects on the project were Jack Clauve and "Pat" Patterson. THE END

New design manual for pole-type buildings

"How to Design Pole-Type Buildings," by Donald Patterson, structural engineer and specialist in this type of construction, is a concise but comprehensive compilation of engineering and design data on the uses of pressure-treated round and sawn timbers in building construction.

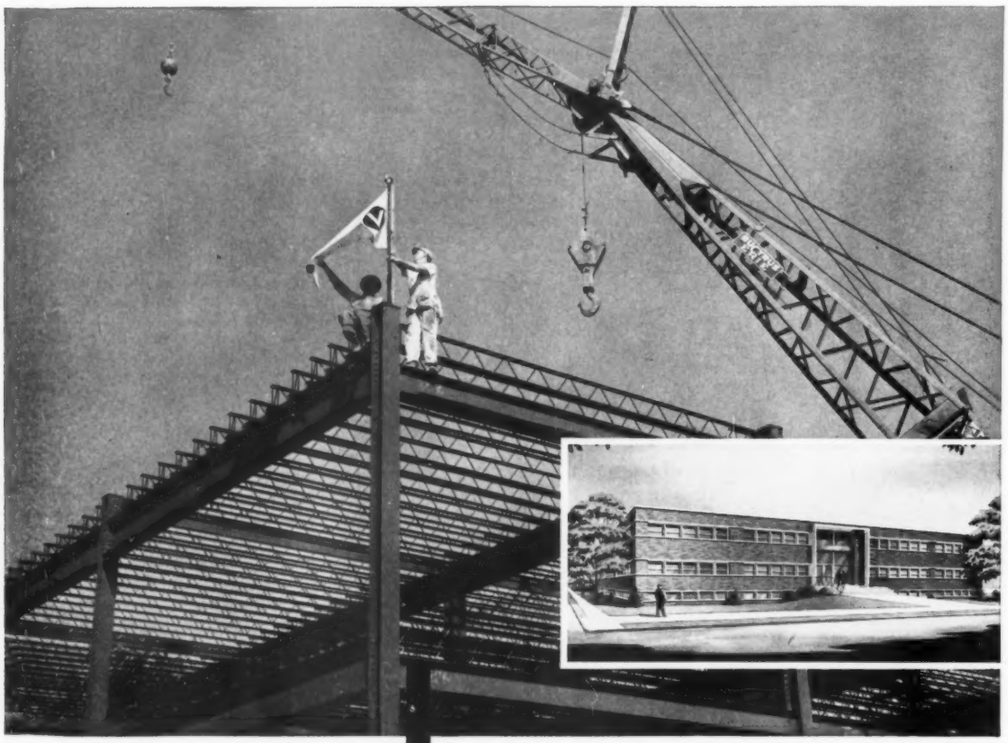
Design procedures for proportioning structural members of various kinds of pole-type buildings are presented, together with illustrations and descriptions of typical examples. The text is supplemented by line drawings, charts, and tables that show readers how to compute live and dead loads, wind pressure and stresses for structural members, as well as the required pole-embedment depths to handle maximum loads and stresses.

This 68-page booklet is available from the publisher, American Wood Preservers Institute, 111 W. Washington St., Chicago 2, Ill. It is priced at $1.50, postpaid, in the United States and Canada; and at $2 elsewhere.

Film on lift-slab method

A 30-minute film, "On the Job", has been released by Great Lakes Lift Slab Corp. describing the lift-slab method of constructing and erecting concrete floors and roofs down on the ground. The picture shows footings being poured, and successive columns and slabs being erected, lifted, and secured in place.

For further information write to Edward D. Gray, Great Lakes Lift Slab Corp., 5306 W. Lawrence, Chicago, Ill.



LIGHTWEIGHT
PRE-DIMENSIONED
LACLEDE
STEEL JOISTS
SPEED CONSTRUCTION

Owner: ST. LOUIS SHIPBUILDING & STEEL COMPANY
General Contractor: Vollmar Bros. Construction Company
St. Louis, Missouri

Hoisting of contractor's jack marks pre-schedule completion of steel work

Set for completion early in 1958, this new office building for St. Louis Shipbuilding and Steel Company is ahead of construction schedule.

Strengthened by Laclede open web steel joists, this two-story steel framed building was erected quickly because shop fabricated joists, dimensioned to close tolerances, eliminated costly and time-consuming field fitting. Identified at the plant for proper location in this steel framed structure, these Laclede joists were delivered to the site ready for immediate placement.

The open web construction of Laclede steel joists insures strength, minimizes dead weight and makes them easy to handle and place. Laclede Steel Joists are designed and manufactured in strict conformity to the sound engineering standards adopted and approved by the Steel Joist Institute.

OTHER LACLEDE CONSTRUCTION STEELS ARE

multi-rib reinforcing bars
welded wire fabric
form and tie wire
spirals
corrugated steel centering
electrical weld gas tubing
conduit
steel pipe

LACLEDE

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

For more facts, use Request Card at page 18 and circle No. 246

This tax quiz may save you money

While construction men are looking ahead to a brand-new year, one old piece of business—their 1957 income tax—remains to be done. Here is a quiz, specially prepared by the American Institute of Certified Public Accountants, that may help you save some money. Check your answers with the correct ones on page 74.

1. You were transferred to another city, and your company gave you a sum of money toward the cost of moving you and your family. For tax purposes you should consider this money as:
   a. a gift that is not taxable
   b. income subject to tax, with a deduction only for your personal expenses
   c. income subject to tax, with a deduction for the cost of moving your entire family
2. You have invested in several blue-chip stocks. The dividends received are exempt up to:
   a. $50, whether you or your wife owns the stock
   b. $100, if the stock is held jointly by you and your wife
   c. $100, regardless of who owns the stock, providing you file a joint return with your wife
3. You are not permitted to deduct contributions to:
   a. charitable societies
   b. educational institutions
   c. political parties
4. You may not deduct as a business expense:
   a. a subscription to CONTRACTORS AND ENGINEERS
   b. commutation fees
   c. costs of attending your trade convention
5. Your 16-year-old son works during the summer for you in your unincorporated business. On his weekly salary he is:
   a. required to pay social security
   b. not subject to social security
   c. permitted to decide whether he wants social-security coverage
6. After you have filed your personal 1957 tax return, the government is allowed to check your return and bill you for additional tax:
   a. on the day you file your 1958 return
   b. two years after you file your 1957 return
   c. three years from the due date of your 1957 return
7. You engage a CPA to prepare your 1957 tax return. His fee is:
   a. not deductible since it is a personal expense
   b. not deductible if you are entitled to a refund
   c. deductible in full

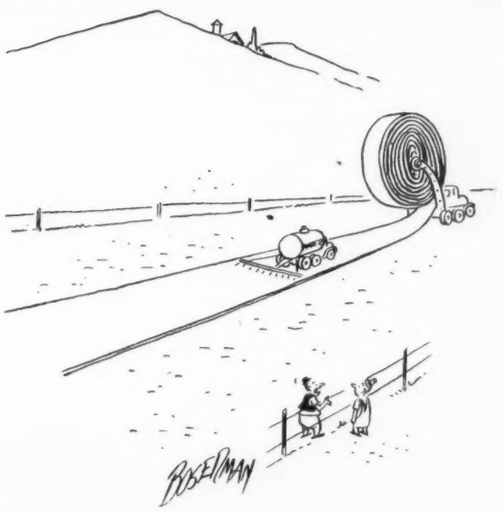
Steel work completed on N. J. marine terminal

Steel work for the new three-berth marine terminal in Port Newark, N. J., was recently completed by the Elizabeth Iron Works, Inc., Union, N. J. The $6,100,000 terminal is included in the building program of The Port of New York Authority.

Film illustrates safety in handling loads

A 16-mm. motion picture film has been released by Macwhyte Co., Kenosha, Wis. "Take-It-Away" traces the history of slings, and shows various types in action. It explains how the capacity of the sling varies, due to stresses that are caused when it is applied to a load. Handling loads safely and economically is the main idea of this 20-minute, black-and-white sound picture.

The film can be obtained by writing to Macwhyte Co., Public Relations Manager, Kenosha, Wis., and is available on a loan basis to safety associations, engineering societies, clubs, manufacturers, and industrial organizations.



"It's called 'Instant Road'. . . . You just add water."

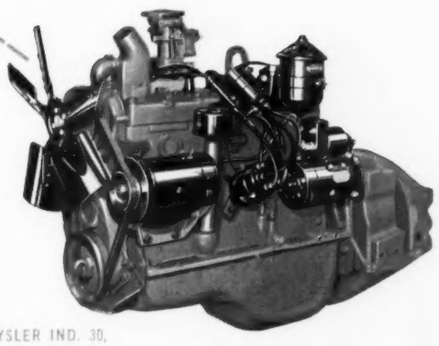
SILENT HOIST & CRANE CO. EXECUTIVES F. E. Flynn, Chief Engineer (left) and M. M. Botnick, General Sales Manager (right) review specifications for the company's latest model Krane Kar, powered by a Chrysler Industrial 30 Engine with fluid coupling. Below, they watch the Krane Kar in operation. This model features an even greater degree of maneuverability and boom flexibility.

KRANE KAR

why Silent Hoist & Crane Co. powers with **Chrysler** Industrial Engines

SEND FOR 1958 INDUSTRIAL ENGINE CATALOG: Dept. F-2, Industrial Engine Division, Chrysler Corporation, Detroit 31, Mich.

Silent Hoist & Crane Co. is a pioneer in the field of heavy-duty materials handling equipment. The famous KRANE KAR and LIFT-O-KRANE are designed for tough jobs and demanding conditions. That's why the company chooses rugged Chrysler Industrial Power. Equally important, Chrysler engines are available with fluid coupling to reduce shock load, prolong engine life. Experience has proved to Silent Hoist engineers, the superiority of Chrysler Industrial Engines. And Chrysler's reputation helps Silent Hoist sell customers—and keep them sold.



CHRYSLER IND. 30, 230 cu. inch displacement engine powers the Krane Kar. Heavier units are powered with Chrysler Ind. 33, 265 cu. inch displacement.

Chrysler
INDUSTRIAL ENGINES
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

For more facts, use Request Card at page 18 and circle No. 247

Labor review

Expulsion of the giant Teamsters Union, overwhelmingly approved by the AFL-CIO convention, will not usher in an era of labor wars, according to spokesmen for both the million-and-a-half-member union and the federation. Both give the impression of being willing to mark time for a spell.

George Meany, as AFL-CIO spokesman in dealing with the Teamsters, expresses lack of confidence in the union's leadership but complete sympathy with the membership and says the door to reaffiliation remains open. And Teamster vice president Einar Mohn, voicing Teamster attitudes, is mostly conciliatory toward AFL-CIO but is not bowing his head. Neither is the union.

The vote to expel was 10,480,598 to 2,226,490. To defeat the recommendation of the convention appeals committee the Teamsters would have had to muster 4,227,244 votes.

The convention reached one of the most dramatic moments in recent labor history after two top officers of the Teamsters Union, vice president Einar Mohn and secretary-treasurer John English, appeared before the convention to try to stem the tide running against the truck union. English declared that the Teamsters were getting a "bum deal" and asked if this was the treatment the organization deserved after a half-century in the labor movement, much of that time helping other unions to win strikes.

But these arguments received no sympathy from AFL-CIO president Meany, who pointed out to a hushed convention that the Teamsters did nothing to remove a vice president who had been convicted of "accepting a bribe for breaking a strike". Meany seemed to be close to snarling as he uttered the words. Then he added:

"This is a sample of what we are up against. And I want to say to you here and now that I am for the Teamster and for the Teamster members. I am for getting the Teamsters away from this corrupt control. And I say to you right here and now, I have the door open—it was open until 11 o'clock last night; it will be open after you finish voting. There is no attempt of any sort, and no plan at all for a war with the Teamsters, and we hope it will never come. But we have got to give these members a chance. We have got to free them from dictatorship."

English talked about the Teamsters being in only "a little trouble". He wanted to know why the other AFL-CIO unions want to condemn the Teamsters "for two or three fellows who have gone wrong". Said English: "After giving you fifty years, giving you all our time and our money, we ask one year to clean up our house. Beck is gone, Brewster is gone, Brennan is gone. There is only one man—Jimmy Hoffa. And Jimmy Hoffa has done more for our international union than anybody connected with it."

Teamster vice-president Mohn's conciliatory attitude toward AFL-CIO was evidenced in a press conference following the expulsion vote. In reference to Meany's remark about the door to reaffiliation being open, Mohn said the Teamsters have no intention of closing it. However, he added, some of "our people" around the country think the price of re-entry is too high—that price apparently being (1) to drop Hoffa and (2) to let some outsider act as administrator of Teamster operations for a term.

Mohn said nothing had been decided yet on testing the expulsion in court. "We have no intention of walking out of here with a chip on our shoulder", he asserted, adding, "At the same time, we are not going to play dead." During the conference Mohn indicated that the Operating Engineers' votes for expulsion had come as a surprise.

The Teamsters' promise of continued cooperation with other unions was contained in an editorial in the union's magazine. Calling its present troubles "temporary", the union said: "We will not raid. We will not wreck. We will not seek to destroy. We will continue to work in harmony in the local central bodies, in state organizations, and through inter-union agreements. We have developed a number of mutual aid pacts with international unions. . . . We will continue to work within the framework of this system of agreements unless we are expressly forbidden."

* * *

New construction remains a strong force in the economy, according to the monthly report of the President's

Vernon (Stub) Faber doing a rough grading operation on a highway widening project inside the city limits of Milwaukee, Wis. The machine is an Austin-Western Super 99 with 6-wheel drive and 6-wheel steer.

"I've operated every make of grader and this A-W Super 99 outperforms them all"

says Vernon (Stub) Faber

As a "boomer" grader operator, Vernon (Stub) Faber has spent the past 16 years on construction jobs all over the country. He has run every make of grader under almost every conceivable operating condition. There isn't much he doesn't know about graders.

Here's what Stub Faber has to say about the A-W Super 99. "I've operated every make of grader, and this A-W Super 99 outperforms them all. It's maneuverable, and you can see everything from an Austin-Western—this is very important for finish grading. The A-W actually speeds up a grading operation, because it does not have to slow down for the grading of intersections. I like the A-W for slope grading, too. With the hydraulically controlled blade, you don't have to leave your seat to change the blade and the all-wheel steer gives you a good grip on the slope."

30% more power — extra maneuverability

Like the famous A-W 4-wheel machine, the new Super 99 features a unique combination that gives it unbeatable performance. With all-wheel drive, you get sure traction under all conditions, plus 30% more power where you need it — at the blade. All-wheel steer gets the grader where you want it in the shortest time; holds every wheel where the footing is best. Teamed together, all-wheel drive and all-wheel steer let you move more material farther and faster because of directed power on every wheel.

Superior blade control

A-W precision sideshift always puts the blade where it's needed. Ends of the blade stay on the ground with no change in the working angle. For top performance on any bank and un-

Council of Economic Advisers. Total construction expenditures (seasonally adjusted) continued in November at the high rate established in October. Non-farm residential outlays increased, but public construction rates declined somewhat. Federal, state, and local rates still were slightly above September, however. Other private construction rates remained steady. The total new construction rate was an estimated $48.5 billion in November.

* * *

Richard Gray's startling proposal that union members voluntarily forego wage increases in 1958 in order to stimulate a sagging economy was soundly rejected by the AFL-CIO convention. In its resolution on collective bargaining, the convention dealt Gray the following blow: ". . . therefore, be it resolved, that the AFL-CIO and its affiliated unions cannot and will not rest on yesterday's laurels or yesterday's living standards. Our collective bargaining efforts will be directed to continuing improvements in wages, hours standards, and benefit and working conditions.

"In the period ahead, we will press particularly for higher wages to bolster present inadequate consumer buying power and restore needed national economic growth. While American labor will cooperate wholeheartedly in the national defense effort, no need has been demonstrated for any wage freeze or for any nation-wide extension of the statutory workweek.

"The AFL-CIO and its affiliated unions will also bend their best efforts (1) to transforming advancing technology into a force, not for growing unemployment, but for increased leisure through reduction in hours of work with no reduction in take-home pay; and (2) to gaining more adequate protection for workers against the strains of ill health, old age, and irregular employment through improved health and welfare plans and programs for guaranteed employment and fully adequate supplemental unemployment benefits.

"We set our sights for wage advances and other improvements not merely to benefit alone the millions of American workers and their families, but because we are well aware that collective bargaining is the most direct means for trade unions to exercise a constructive effect on the economy. We are secure in the knowledge that success in vigorous bargaining efforts will benefit the well-being of all the nation by contributing to the achievement of a dynamic, expanding balance between greater productive power and greater purchasing power."

Labor Secretary Mitchell does not agree with the AFL-CIO view that wage increases are necessary this year to increase consumer purchasing power and prevent or cure a recession.

The important thing to working people, according to Mitchell, is "real wages and not necessarily the amount of dollars" they receive. He warns against wage increases which would serve to spur a "further inflationary spiral".

The Secretary, expressing his views at a recent press conference, declined to take a pessimistic view of 1958. He does not concede existence of a recession, but says that the economy is "facing a cyclical adjustment in 1958 but not one that should cause us any serious concern". He expected some increases in unemployment by this month, but does not look forward to "large-scale prolonged unemployment" or to unemployment near the 6 million mark. He indicated that economists with whom he has talked see evidences of an upturn somewhere around the middle of 1958.

Regarding government plans on the economic front, Mitchell mentioned the budget, saying that "increasing defense needs will be felt".

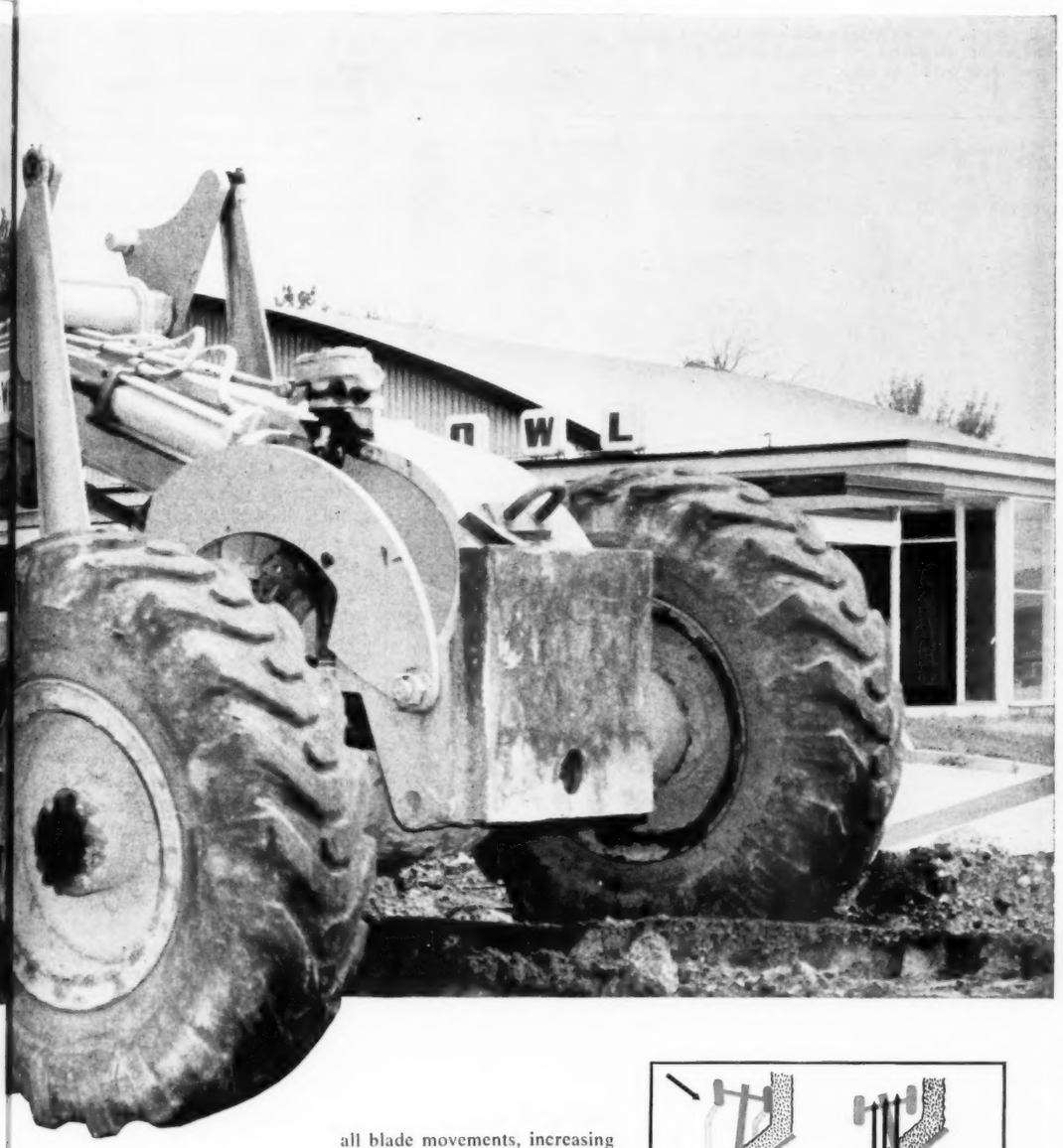
Strong points he noted in the economy are an increase in residential building, which will help the steel industry; the six-million-car year anticipated by the auto industry, and the road-building program, which will be stepped up over $1 billion in 1958 and to a $2 billion annual rate in 1959.

Mitchell noted that the time lost in strikes and the number of strikers were lower in 1957 than in any postwar year and interpreted this as meaning that management and labor are learning to work together more than ever before.

* * *

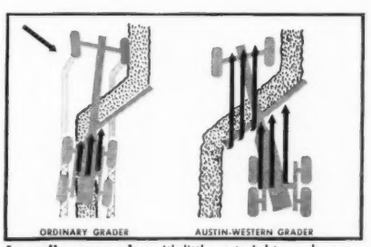
Hourly **labor costs for plumbing work** in Alameda County, Calif., will increase 81 cents over the next three years under a new contract negotiated by Plumbers Local 144 and representatives for two contractor associations.

Hourly rates as of January first are: journeymen, $3.87½; foremen, $4.37½; general foremen, $4.62½.



equaled reach, the high-lift blade can be operated through the full range of 90° left or right. And because the blade is completely reversible, reverse grading on narrow roads or between forms is easy with use of the rear steer. Precision hydraulic controls, instantly responsive to a finger's touch, speed all blade movements, increasing efficiency and reducing operator fatigue.

Preference for A-W graders is the rule, rather than the exception, among contractors and the experienced operators who know them. You can take an A-W more places, move more dirt, do more jobs, and handle them with less effort than with any competitive machine. As a contractor, you'll want to get the complete A-W story. Write today for free booklet.



An ordinary grader with little material to push moves ahead in a straight line. But when a heavy windrow is tackled, side thrust causes the dead front end to go out of control and slip sideways.

On A-W graders, all-wheel drive and all-wheel steer team up with the blade — the rear drivers push behind the toe of the blade, the front drivers pull ahead of the heel of the blade. As a result, the machine moves straight ahead under perfect control.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

BALDWIN BLH LIMA-HAMILTON

For more facts, use Request Card at page 18 and circle No. 248

Since rubber-tire haul units could not work in the soft, wet areas of the Coralville Dam, near Iowa City, Iowa, the contractor used a spread of crawler tractors with track wagons. A Koehring 605 dragline dumps excavated material into an Athey track wagon pulled by an International TD-24 tractor. In the foreground, an Adams 550 motor grader and a LeTourneau-Westinghouse Model C Tournapull move out of the area.

Track wagons help scraper[illegible] m

Material from core trench used in toe dike and pervious portions of the earth embankment and spillway structures of Coralville Dam

While rubber-tire scrapers are hauling most of the earthwork for the embankment of Coralville Dam, a spread of crawler tractors with track wagons took over the hauling of wet material from the core trench under conditions which would have bogged down almost any other haul units. This material was excavated by draglines and hauled by the track wagons to fills or waste areas.

Located on the Iowa River a few miles upstream from Iowa City, Coralville Dam is being constructed under the supervision of the Rock Island District of the Corps of Engineers. Planned to control flood waters of the river, the project includes a series of contracts totaling about $9 million.

The initial phase of the project was started in 1949, but work was suspended in 1952, after completion of the first two phases, when appropriations were cut because of the Korean conflict. The Stage III contract for the main portion of the earth embankment and the spillway structure was awarded late in 1955 to a joint venture of the Weitz Co., Inc., Des Moines, Iowa, and J. D. Armstrong Co., Inc., Ames, Iowa. This $2,215,000 contract and the other incidental items are scheduled for completion in June.

Armstrong moved onto the site shortly after the contract was awarded in order to begin the earthwork items. Weitz is handling the construction of the concrete spillway which was started early last year.

Wet material, soft ground

In planning the project, Armstrong found that certain portions of the material excavated from the core trench could be used in the toe dike and for pervious portions of the embankment. But it would be impossible for ordinary rubber-tire haul units to operate in the soft, wet areas from which this material was to be removed and to which it would be delivered.

To do this job, the contractor decided to use International TD-24 crawler tractors and 13-yard Athey Forged-Trak trailers. The main portion of the embankment is being brought in from borrow pits by Tournapulls and Euclid scrapers.

Careful planning and scheduling of the work was necessary to keep the job on time. Armstrong did many of

not even king size boulders stopped this Manitowoc!

Huge boulders . . . too big to pass through the dipper . . . didn't stop this Manitowoc 2½-yd. Model 3500 shovel from loading out an average of 1200 to 1300 yds. of abrasive granite every 7½ hour shift. Goodfellow Brothers of Wenatchee, Washington used two of the Model 3500 rigs for handling rock on a Washington State Highway project. This was a rush job . . . moving over 160,000 yards of rock alone in four month's time.

This rock was hard to blast which resulted in the huge, hard-to-handle boulders. However, the Model 3500 shovels have the power, speed and capacity to keep haul units moving in a steady stream from the job area. Simple, balanced design throughout delivers more horsepower to the dipper . . . there's no wasted power. The entire machine has only 14 gears and pinions and only working gears turn . . . a power-saving feature found *exclusively* on Manitowoc shovels and cranes. A massive, one-piece carbody mounted on long, wide-spread crawlers provides greater stability. Many other features give you advantages to bid lower . . . make more money on any job.

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20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.

For more facts, use Request Card at page 18 and circle No. 249

pen muddy areas of earth dam

An International TD-24 push-tractor assists a LeTourneau-Westinghouse Model C Tournapull in loading material at the hillside borrow pit. Material from this pit was used for the impervious core of the dam.

the small items as quickly as possible. These included clearing and grubbing, building roads, and setting up shops and offices. He fenced in the construction area to protect visitors from injury.

The crews then plunged immediately into the rock excavation of the inlet and outlet channels leading to and from the outlet control structure and conduit which had been built previously. This portion of the work was completed during the winter so as to be ready for the closure and diversion in June, 1957.

The closure was made by throwing an earth dike across the bed of the stream, forcing the water through the outlet works. The closure dike and cofferdams around the work area were built up high enough to withstand the highest flood which could be anticipated on a 10-year basis. These cofferdams proved adequate when a 3½-inch rainfall hit the area during the early stages of the core trench excavation.

Excavate core trench

Dewatering and excavating the core trench were the first major operations after the closure. Surface water was pumped with conventional pumps, and two stages of wellpoints were installed to dewater the area all the way down to solid rock, about 30 feet below the normal river level.

The wellpoint system contained about 130 wellpoints in each stage. These were 1½×42-inch points with 16 to 20-foot risers. They were connected to 8 and 12-inch headers which were pumped by four diesel-powered pumps and one gasoline-powered pump.

As the ground water level was lowered, a Koehring 605 dragline with a Hendrix 2¼-yard bucket excavated the core trench, loading the material into a spread of four Athey Forged-Trak 13-cubic-yard trailers pulled by International TD-24 tractors. Although the ground water was drawn down so that no water actually stood in the excavation, the material was very wet and some of it was very difficult to handle.

The track-trailers were loaded on a bench at the side of the excavation, and this area was often soft and muddy. When loaded, they climbed a steep grade which would have been prohibitive for rubber-tire machines.

(*Continued on next page*)

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- ☐ H-25 New Idea Orange
- ☐ H-3 J. D. Green
- ☐ H-10 J. D. Yellow
- ☐ H-11 J. D. Red
- ☐ H-4 Caterpillar Yellow
- ☐ H-5 Black
- ☐ H-9 Euclid Green
- ☐ H-26 New Idea Green
- ☐ H-13 Oliver Red
- ☐ H-14 Oliver Orange
- ☐ H-22 Oliver Yellow
- ☐ H-12 Oliver Green
- ☐ H-1 Allis-Chalmers Orange
- ☐ H-7 Ferguson Gray
- ☐ H-27 Light Euclid Green
- ☐ H-18 Massey-Harris Yellow
- ☐ H-19 Massey-Harris Red
- ☐ H-16 New M-M Prairie Gold
- ☐ H-17 M-M Red
- ☐ H-20 Ford Gray
- ☐ H-21 Ford Red

For more facts, use coupon, or Request Card at page 18 and circle No. 250

(*Continued from preceding page*)

Granular material, suitable for use in the toe dike or pervious section of the dam, was taken directly to this area by these haul units. Unsuitable material was hauled to a storage area. Here the bottom-dump trailers dropped the wet material in a flat area and a Caterpillar D6 tractor-dozer pushed it into piles. Some of this material was used in parts of the structure after it drained and dried out; and the remainder was wasted.

The core trench extended across the valley on the axis of the dam. It was excavated down to solid rock through more than 40 feet of river bottom deposits. The bottom of the trench was a minimum of 15 feet wide, and its sides sloped at 1½ to 1, making its top width well in excess of 100 feet.

After a grout curtain was placed in the underlying rock, the core trench was backfilled with impervious earth material which was carried on up to form the 22-foot top of the dam. This impervious core of the dam had a 2 to 1 slope on the upstream face and a ¾ to 1 slope on the downstream side. Additional sections of random and pervious fill flattened the finished slopes of the structure to 4 to 1 on the upstream and 3½ to 1 on the downstream sides. Both sides will be protected by riprap.

Place grout curtain

As soon as a portion of the core trench was completed. Balmer Core Drilling Co., Aledo, Ill., began drilling the series of exploratory holes required under the contract. These 3-inch holes were drilled at 50-foot centers at least 20 feet into the rock to determine the nature of the underlying strata. Grout holes 1⅜ inches in diameter were then drilled at 25-foot centers with intermediate holes at 12½ feet where necessary.

Cement grout was pumped into the holes to penetrate any crevices in the rock and to provide a watertight curtain under the core of the dam.

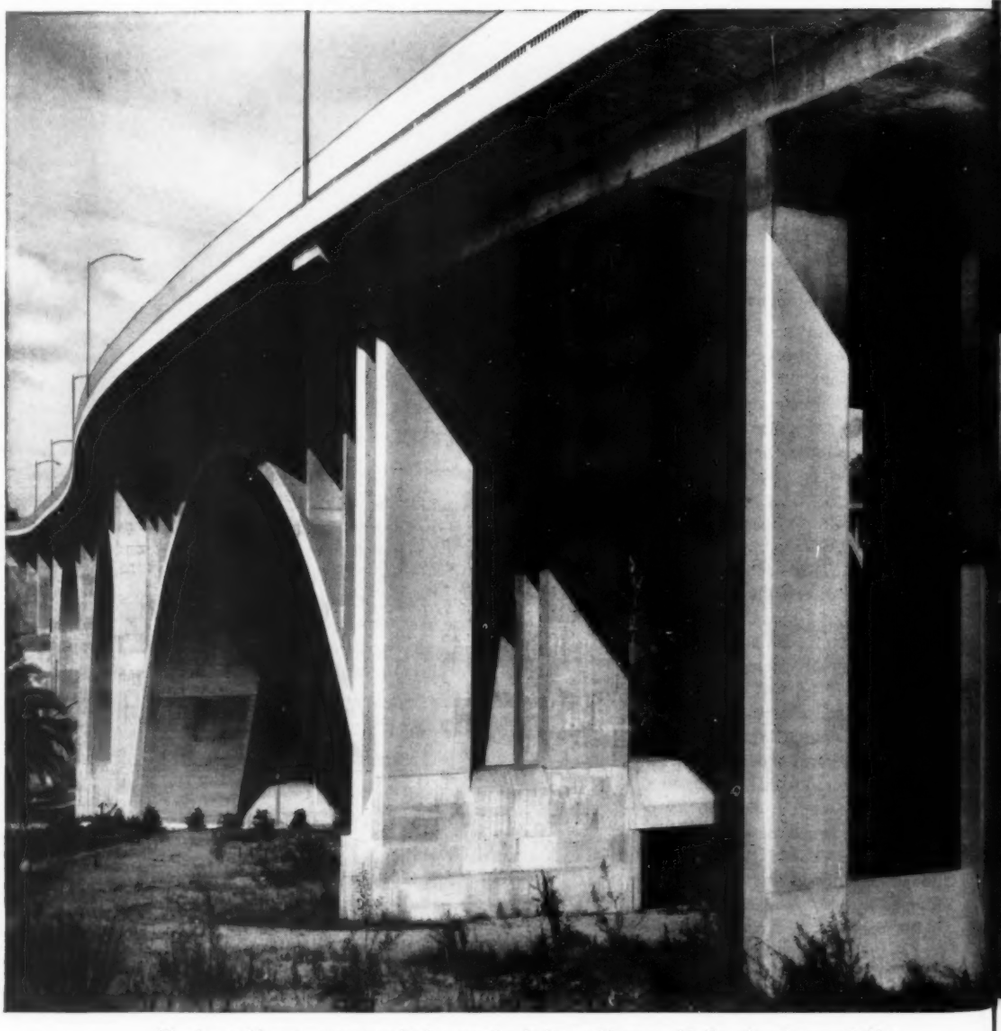
Material for the impervious core of the dam was obtained from borrow pits near the site and from the excavation of the spillway channel. This and the balance of the random and pervious materials were excavated and delivered to the embankment by rubber-tire scrapers.

Three of the nine scrapers used on the embankment were new LeTourneau-Westinghouse C Tournapulls. The other six were Euclid 22-yard scrapers pulled by "Euc" 4-wheel tractors. International TD-24 tractors pushed the scrapers on the loading cycles.

On the embankment, the material was compacted with a LeTourneau-Westinghouse sheepsfoot roller and two Grace 50-ton rubber-tire compactors pulled by International TD-24 tractors. Before starting to place a new lift of material, the surface of the lift last placed was worked by two Rome disks to provide a good bond between the courses. A Caterpillar D8 tractor-dozer and an Adams Model 550 motor grader shaped the

A Euclid scraper, push-loaded by an International TD-24 tractor, cuts a contour drainage ditch to control runoff over the bank adjacent to the dam.

Pasadena freeway bridge demonstrates **Three**
of fir plywood



Fir plywood forms cut costs and solve complex design problems on this Pasadena freeway bridge

A Koehring 605 dragline with Hendrix 2¼-yard bucket dumps the heavy, wet material excavated from the core trench into an Athey track wagon pulled by an International TD-24 tractor. These were the only rigs which could handle the wet material.

Blasted rock is loaded by a P&H 1½-yard shovel into the apron feeder of a primary scalping unit. The material passes the Cedarapids vibrating screen and is conveyed to a Cedarapids Super Tandem for processing into road rock, concrete aggregates, and stone for riprap.

key advantages concrete forms

1. design adaptability

On this 3.3 million dollar Colorado Street freeway bridge, Pasadena, California, fir plywood helped solve a complex form problem posed by the six giant arch ribs supporting the roadway. Forms were ⅝" fir plywood, specified because of its adaptability to built-up slip forms.

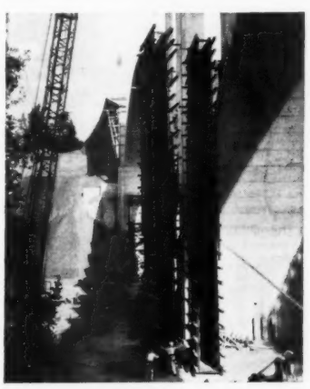
2. time and labor savings

Fir plywood also speeded construction time for huge built-up form sections used for scores of spandrel columns and main pier columns. Sections ranged from 5 to 80 feet in height. Workability and multiple re-use make fir plywood ideal for such applications.

3. smooth concrete surfaces

Fir plywood was specified by the California State Highway Department to assure smooth surfaces on all exposed concrete. The contractor, Guy F. Atkinson Co., developed the form system which was moved laterally from one arch to the other, an engineering feat considered to be unique in the construction field.

Close-up of ⅝" fir plywood arch rib form section. After pouring one set of arches, entire falsework was lowered several inches and skidded into place for second set.



Workmen stripping one of giant built-up 80-foot column forms. Forms were of ⅝" fir plywood with 2 x 6 studs and walers. Multiple re-use is one of plywood's many advantages in the form field.

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Douglas Fir Plywood Association is a non-profit, industry organization devoted to research, promotion, quality maintenance.

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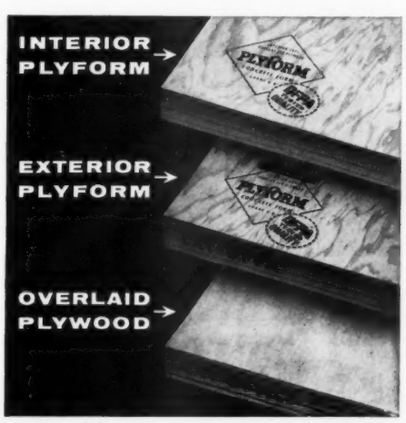
OVERLAID FIR PLYWOOD—special panel with hard, glossy fused resin-fiber surfaces. Waterproof glue. Up to 200 re-uses.

FOR YOUR FILES: Complete application-specification-design portfolio assembly. Write (USA Only) Douglas Fir Plywood Association, Tacoma 2, Washington, Dept. 138.



COLORADO STREET PIONEER BRIDGE
LOCATION: Pasadena, California
CONTRACTOR: Guy F. Atkinson Co.
South San Francisco, California

For more facts, use Request Card at page 18 and circle No. 251

lifts of material and built and maintained the haul roads.

Quarry produces rock

Both upstream and downstream faces of the dam are being protected by a 2-foot surfacing of riprap placed on a 9-inch gravel backing. Rock for the riprap and backing as well as road-surfacing material and concrete aggregates is being produced in a quarry near the dam by a subcontractor, Weaver Construction Co., Iowa Falls.

An existing quarry, on a farm about a mile downstream from the east abutment of the dam, was expanded for this project. To avoid congestion on the local roads, and to permit heavy loads to be hauled, Weaver built a new haul road between the quarry and the dam.

Earth overburden in the quarry area was stripped to a 40-foot depth by Caterpillar D8 tractors and scrapers. Six-inch holes, drilled on a 9× 15-foot pattern with a Mayhew rotary drill, were loaded with DuPont Nitromon A and No. 2 dynamite. The drilling and blasting exposed a 20-foot face of rock in the quarry.

To process the rock, Weaver moved in a portable setup consisting basically of a scalping unit and a Cedarapids Super Tandem crushing and screening plant. A P&H 1½-cubic-yard shovel loaded the blasted rock into the apron feeder of the scalping unit which fed the material to a 4× 6-foot double-deck screening unit. One deck was fitted with a punch plate with 8-inch round holes and the other was a solid plate. Material passing the 8-inch punch plate was conveyed to the crusher. Retained material was stockpiled for riprap by a Koehring Dumptor.

The jaw and roll crushers of the Cedarapids Super Tandem unit reduced the minus 8-inch material to minus 1-inch size for road-surfacing material. An additional plant unit was added to make the two sizes of concrete aggregate. These same plant units produced the backing material for the riprap.

During the early stages of the work, all classes of material were stockpiled at the quarry and Euclid end-dumps later delivered the materials to the project site. The project required 44,550 cubic yards of riprap, 16,700 cubic yards of backing stone

(Continued from preceding page)

During the busy part of the construction season, the project operated on a 6-day week with two 9½-hour shifts per day. Light towers, which illuminated the area at night, have 13 floodlights powered by a Caterpillar D311 generator set at the base.

and aggregates for 31,660 cubic yards of concrete, in addition to the road-surfacing rock.

In addition to the three phases of the dam construction which will be concluded with the completion of the Weitz-Armstrong contract, the overall project includes a number of contracts for relocation of roads, railroads, and utilities and for the raising or tying down of a number of structures within the reservoir area.

During the busy part of the construction season the project operated on a six-day week with two 9½-hour shifts per day. This meant that much of the work was done at night under artificial illumination. Night lighting was provided by a series of floodlight towers, each powered by a Caterpillar D311 generator set.

Armstrong's supervisory staff on the earthwork portion of the contract is headed by project manager Jim Merrick who is assisted by foremen Bill Guthrie, Dean Schroeder, and Dan Davis. The drilling and grouting operations were run by V. R. "Red" Balmer. Superintending Weaver's quarrying is Charles Good.

The resident engineer for the Rock Island District of the Corps of Engineers on the dam and all remedial works is George Roehr. His assistant is Edward Elson. The district engineer of the Rock Island District is Col. John W. Wilson, Jr.

THE END

Answers to quiz on page 67

1 (c) The money must be reported as income, but you may deduct the cost of moving your family. If the amount exceeds your expenses, the excess is taxable. However, if your expenses were more than the amount received, the difference is not deductible.

2 (a and b) Both are correct. All taxpayers are entitled to a $50 dividend exemption. A husband and wife may combine their exemptions and receive $100 in dividends tax free, providing the stock is jointly owned. If one owns stock, a double exemption cannot be taken on a joint return.

3 (c) You may not deduct donations to an organization which spends a substantial part of its time lobbying or distributing political propaganda.

4 (b) The cost of traveling to and from work is a personal expense, and not deductible. Both a and c are deductible.

5 (b) Since your son works for *you*, you are not supposed to pay social security tax on his wages, nor is he required to make contributions. If your business is incorporated, however, the corporation must pay social security tax on his salary.

6 (c) In the absence of fraud or substantial understatement of income, the government has three years from the due date of your 1957 return to check it and bill you for additional tax.

7 (c) The fee which a CPA charges you to prepare a tax return or defend the accuracy of your return before the Treasury Department is deductible in full, if you itemize deductions.

Firm uses computer for highway work

Harley, Ellington, & Day, Inc., Detroit, is the first Michigan architectural and engineering firm to use a Bendix electronic digital computer on highway work. The firm is using the machine for earthwork problems on access roads, interchanges, overpasses, and railroad separations.

The company has two trained programmers to operate the machine, which will be available to other Michigan architects and engineers for assistance on special programs.

Let the men who make 'em—fix 'em

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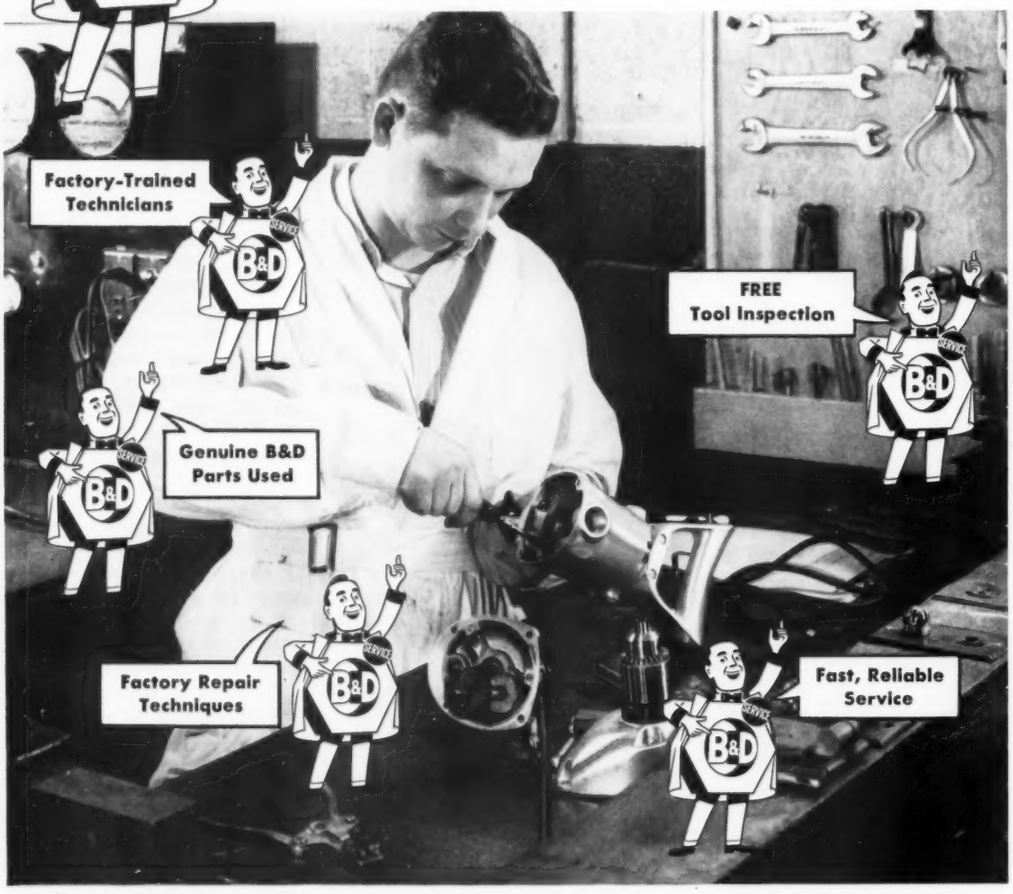

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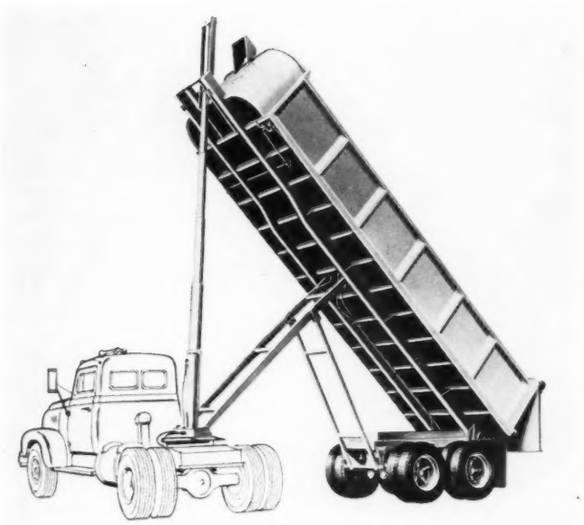
PRODUCT PARADE

For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.



Body hinged at rear of tandem on new dump trailer

Trailmobile, Inc.'s Model 254-FG frameless dump trailer features a body hinged at the rear of the tandem frame, permitting all wheels to remain on the ground when the body is in a raised position. The new design is said to make the unit up to 3,000 pounds lighter than conventional dump trailers.

The choice of inside length ranges from 21 to 32 feet. Over-all width is 95½ inches; and the inside width is 88 inches.

A floor height of 43½ inches is maintained when the trailer is in full elevated position.

Write to Trailmobile, Inc., Dept. C&E, 31st and Robertson Ave., Cincinnati 9, Ohio, or use the Request Card at page 18. Circle No. 69.

Outrigger system on new truck-crane adds bonus capacity

A new air-controlled, 40-ton-capacity truck-crane, featuring an outrigger said to add tons of bonus capacity, is available from the American Hoist & Derrick Co.

The new outrigger system features exceptionally deep center sections that swing out from the carrier, rather than sliding out, and which are locked into position. These sections are slightly longer than ordinary outriggers and are located almost directly under the rotating base of the machine, thereby becoming an extremely steadying factor for the over-the-side operation, according to the company.

The travel weight of this new crane is spread over four axles of a powerful mobile carrier. The carrier is available both in 9 and 10-foot widths.

For further information write to the American Hoist & Derrick Co., Dept. C&E, 63 S. Robert St., St. Paul 7, Minn., or use the Request Card at page 18. Circle No. 132.

Augment motor grader line with new 15-ton unit

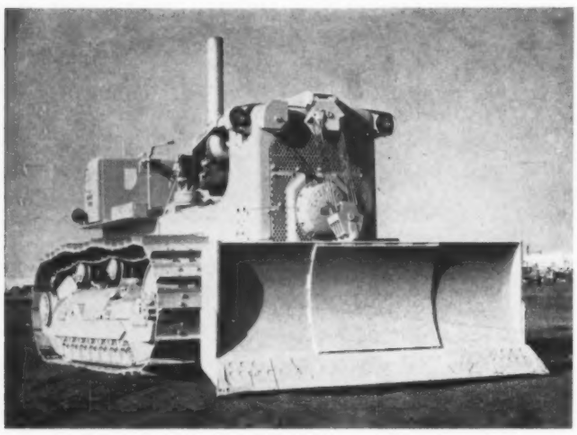
The addition of the extra-heavy-duty Model 160 to its line of motor graders is announced by The Galion Iron Works & Mfg. Co. Powered by a Cummins 6-cylinder, 4-cycle, 160-hp diesel engine, the total weight of the grader, with scarifier, is 30,020 pounds.

The Model 160 has a constant-mesh transmission, with six overlapping forward speeds varying from 1.3 to 22.6 mph, and high and low reverse speeds.

A special cerametallic-faced engine clutch is reported to be an important feature of the unit. According to the manufacturer, this Morlife clutch is not affected by heat or cold, requires no cooling system, and is said to give full-load power delivery on all occasions.

Listed as standard equipment are a 156×29×¾-inch hydraulic shiftable moldboard, combination hand and hydraulic booster steering, 14.00×24 10-ply tires on both front and rear wheels, and four-wheel brakes.

For further information write to The Galion Iron Works & Mfg. Co., Dept. C&E, Galion, Ohio, or use the Request Card that is bound in at page 18. Circle No. 74.



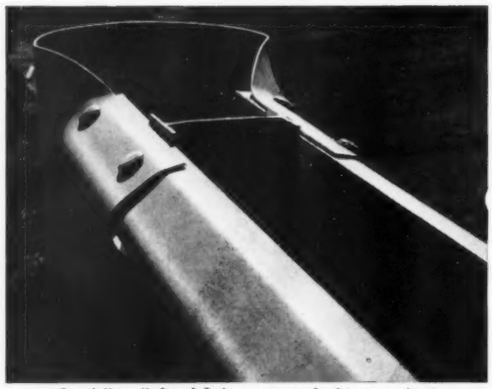
Tandem push-loading of scrapers with two Caterpillar D9 tractors is said to be both practical and economical with the Peterson cushion push dozer (shown in photo) and cushion push block. According to the manufacturer, the lessening of contact shock reduces the total pushing time, thus aiding increased production. Four heavy-duty, shock-absorbing pads in each push dozer and block serve to cushion the scraper, tractors, and operators from sudden, heavy impact upon contact. The company points out that the push is transmitted directly through the tractor, not through the final drive. For further information write to the **Peterson Tractor & Equipment Co.**, Dept. C&E, 955 First Ave., San Leandro, Calif., or use the Request Card at page 18. Circle No. 85.

Safety Down the Middle

Mounted back to back on steel posts and installed as a median barrier, Bethlehem Beam Guard Rail provides a double strip of steel, strong enough to withstand severe shocks from colliding vehicles from either side. Yet it is flexible enough so that in most cases, the vehicle is redirected parallel to the rail with minimum damage to vehicle and rail.

Beam Guard Rail comes in standard 12 ft 6 in. lengths of either 12 or 10 gage steel. However, lengths and fitting-up specifications can be adopted to any need. Currently, Beam Guard Rail is installed as median dividers on the Pennsylvania Turnpike, New York Thruway, Connecticut Turnpike, New Jersey Turnpike, the Merritt Parkway, and highways in Illinois, Maryland, and other states.

We will gladly send you our new booklet "Bethlehem Beam Guard Rail," No. 435, which gives full details and specifications. Just contact the nearest Bethlehem sales office, or write to us direct at Bethlehem, Pa.



Specially-rolled end-fitting protects double row of rail

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

For more facts, use Request Card at page 18 and circle No. 253

Paint for heavy equipment dries fast, inhibits rust

A new enamel and rust-inhibitor primer paint for use on heavy equipment is offered by Robeson Preservo Co. The paint comes in 12 high gloss colors, has high coverage and excellent color retention, and works equally well with brush or spray gun, according to the manufacturer.

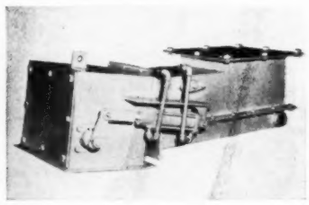
The primer is said to be exceptionally fast-drying, and in most instances only the primer and one coat of enamel are required for a satisfactory finish. Where the metal does not require an abrasive-resistant coating, but must be protected against rust, the primer coat alone is sufficient.

For further information write to the Robeson Preservo Co., Dept. C&E, 160 Merchant St., Port Huron, Mich., or use the Request Card at page 18. Circle No. 87.

New-type cement feeder has no moving parts

A cement feeder with no moving parts is announced by the Butler Bin Co.

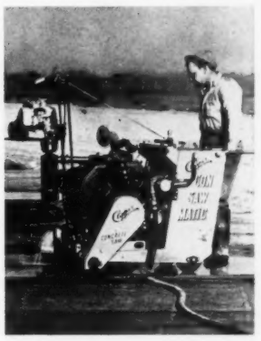
Designated Airflomatic, it employs a cushion of high-volume, low-pressure air on which the cement rides, and is said to provide high precision, positive feeding at all times. The current of air is supplied by a blower which also aerates and fluffs the cement in the overhead bin.



According to the manufacturer, the Airflomatic feeder can be installed on all road batching or ready-mix concrete plants regardless of make, and does, in fact, completely take the place of vane feeders. Installation, it is claimed, is quick and easy.

For further information write to the Butler Bin Co., Dept. C&E, Waukesha, Wis., or use the Request Card at page 18. Circle No. 20.

For more facts on Gulf Oil Corp. product on spread on insert, use request card at page 18 and circle No. 255



C-810 and
rite to the
sas City 8,

This roller, hardfaced with Victoralloy, shows practically no wear after crushing 40 tons of rock hourly, 8 hours daily for 30 days.

HOW TO SAVE ON ROLLERS AND ROD
....Use VICTOR Hardfacing

Tracy Rock & Gravel Co., Tracy, Calif., crushes 40 tons of rock hourly, prolongs roller life on this rough work by rebuilding with 1/4" VICTORALLOY #1 Bare Electric rod, 28" length. Says plant superintendent Albert Parker:

> "Victoralloy's ease of application and fast buildup mean a lot to us. There is no lost time as we use 28" length rod; when it burns down, we touch a new rod to the old one, and keep on welding without even lifting the helmet."

You, too, can save rod and increase working life of crusher rolls, screens, shovel teeth, tractor rollers and idlers, dredge pumps and many other parts subjected to abrasion and severe impact. Simply hardface with VICTORALLOY. It welds to manganese, steel or cast iron. You get all position hardfacing, exceptional arc stability, deposits free of porosity, fast application without slag interference. Try it. Order a supply from your VICTOR dealer TODAY.

• FREE •
Victor Hardfacing Manual shows you right rod to use and how to apply it.
Write us NOW for your copy.

Profitable dealerships open; inquire now!

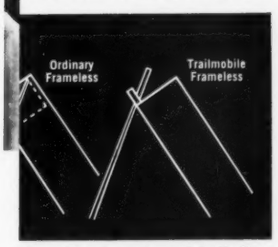
VICTOR
for hardfacing

VICTOR EQUIPMENT COMPANY
ALLOY ROD AND METAL DIVISION
13808 E. Imperial Highway, Norwalk, Calif. • Wakita, Oklahoma

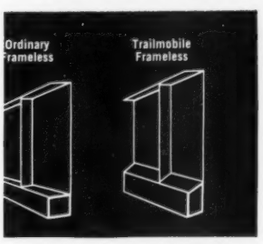
For more facts, use Request Card at page 18 and circle No. 254

TRAILER

beatable features



ube—Newly patented *bail* elim-
space consuming doghouse . . .
lift point for added stability.



is deposits—Trailmobile frame-
stays clean because sloped run-
rds throw off dirt and debris.

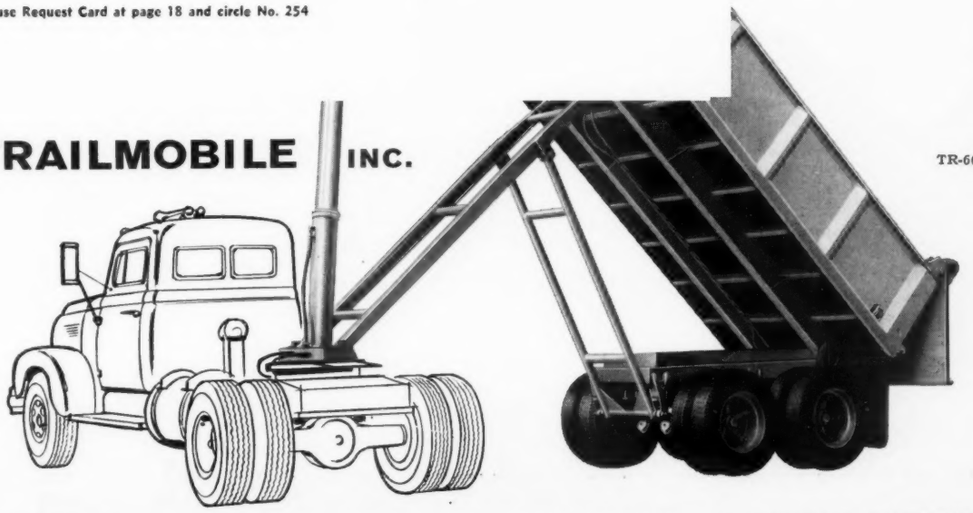
most all makes of tractors are available from the Freeman Loader Corp.

Designated Xtra Trax, the wheels are designed to give positive crawler-action to wheel-type tractors, and to reduce slippage under any soil conditions. They eliminate the need for wheel weights or fluid in tires, and are of steel construction. Attachment is easy, and the wheels need not be taken off for operation on cement or surfaced roads, according to the manufacturer.

For further information write to the Freeman Loader Corp., Dept. C&E, Blair Pike Road, Peru, Ind., or use the Request Card at page 18. Circle No. 71.

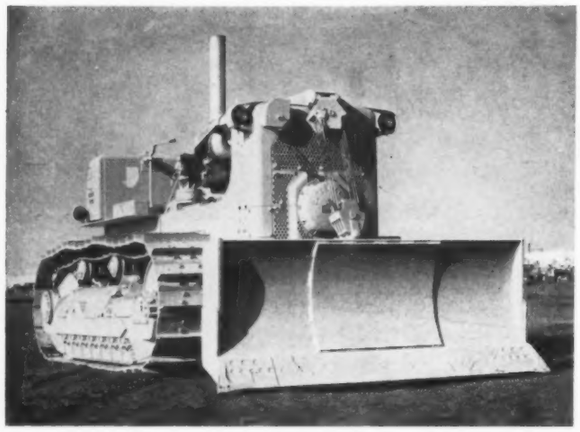
TRAILMOBILE INC.

TR-668



CINCINNATI 9, OHIO • LONGVIEW, TEXAS • SPRINGFIELD, MISSOURI • BERKELEY 10, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 257



Tandem push-loading of scrapers with two Caterpillar D9 tractors is said to be both practical and economical with the Peterson cushion push dozer (shown in photo) and cushion push block. According to the manufacturer, the lessening of contact shock reduces the total pushing time, thus aiding increased production. Four heavy-duty, shock-absorbing pads in each push dozer and block serve to cushion the scraper, tractors, and operators from sudden, heavy impact upon contact. The company points out that the push is transmitted directly through the tractor, not through the final drive. For further information write to the **Peterson Tractor & Equipment Co.**, Dept. C&E, 955 First Ave., San Leandro, Calif., or use the Request Card at page 18. Circle No. 85.

Paint for heavy equipment dries fast, inhibits rust

A new enamel and rust-inhibitor primer paint for use on heavy equipment is offered by Robeson Preservo Co. The paint comes in 12 high gloss colors, has high coverage and excellent color retention, and works equally well with brush or spray gun, according to the manufacturer.

The primer is said to be exceptionally fast-drying, and in most instances only the primer and one coat of enamel are required for a satisfactory finish. Where the metal does not require an abrasive-resistant coating, but must be protected against rust, the primer coat alone is sufficient.

For further information write to the Robeson Preservo Co., Dept. C&E, 160 Merchant St., Port Huron, Mich., or use the Request Card at page 18. Circle No. 87.

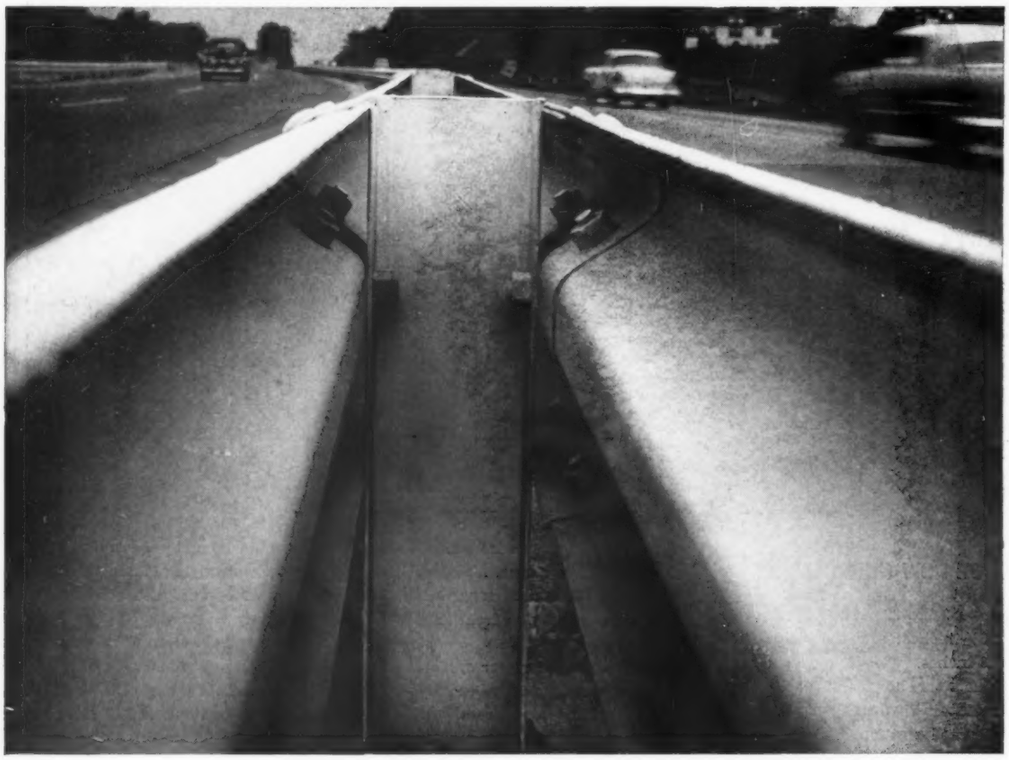
New-type cement feeder has no moving parts

A cement feeder with no moving parts is announced by the Butler Bin Co.

Designated Airflomatic, it employs a cushion of high-volume, low-pressure air on which the cement rides, and is said to provide high precision, positive feeding at all times. The current of air is supplied by a blower which also aerates and fluffs the cement in the overhead bin.

According to the manufacturer, the Airflomatic feeder can be installed on all road batching or ready-mix concrete plants regardless of make, and does, in fact, completely take the place of vane feeders. Installation, it is claimed, is quick and easy.

For further information write to the Butler Bin Co., Dept. C&E, Waukesha, Wis., or use the Request Card at page 18. Circle No. 20.

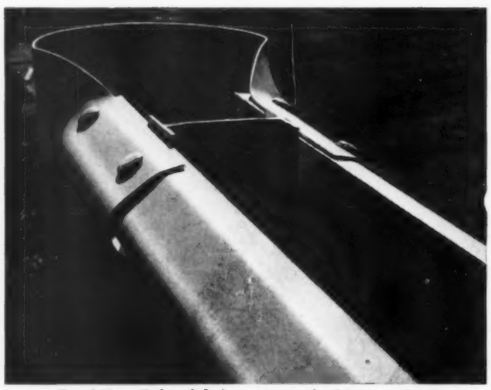


Safety Down the Middle

Mounted back to back on steel posts and installed as a median barrier, Bethlehem Beam Guard Rail provides a double strip of steel, strong enough to withstand severe shocks from colliding vehicles from either side. Yet it is flexible enough so that in most cases, the vehicle is redirected parallel to the rail with minimum damage to vehicle and rail.

Beam Guard Rail comes in standard 12 ft 6 in. lengths of either 12 or 10 gage steel. However, lengths and fitting-up specifications can be adopted to any need. Currently, Beam Guard Rail is installed as median dividers on the Pennsylvania Turnpike, New York Thruway, Connecticut Turnpike, New Jersey Turnpike, the Merritt Parkway, and highways in Illinois, Maryland, and other states.

We will gladly send you our new booklet "Bethlehem Beam Guard Rail," No. 435, which gives full details and specifications. Just contact the nearest Bethlehem sales office, or write to us direct at Bethlehem, Pa.



Specially-rolled end-fitting protects double row of rail

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

For more facts, use Request Card at page 18 and circle No. 253

For more facts on Gulf Oil Corp. product on spread on insert, use request card at page 18 and circle No. 255

This roller, hardfaced with Victoralloy, shows practically no wear after crushing 40 tons of rock hourly, 8 hours daily for 30 days.

HOW TO SAVE ON ROLLERS AND ROD

....*Use VICTOR Hardfacing*

Tracy Rock & Gravel Co., Tracy, Calif., crushes 40 tons of rock hourly, prolongs roller life on this rough work by rebuilding with 1/4" VICTORALLOY #1 Bare Electric rod, 28" length. Says plant superintendent Albert Parker:

> "Victoralloy's ease of application and fast buildup mean a lot to us. There is no lost time as we use 28" length rod; when it burns down, we touch a new rod to the old one, and keep on welding without even lifting the helmet."

You, too, can save rod and increase working life of crusher rolls, screens, shovel teeth, tractor rollers and idlers, dredge pumps and many other parts subjected to abrasion and severe impact. Simply hardface with VICTORALLOY. It welds to manganese, steel or cast iron. You get all position hardfacing, exceptional arc stability, deposits free of porosity, fast application without slag interference. Try it. Order a supply from your VICTOR dealer TODAY.

• FREE •

Victor Hardfacing Manual shows you right rod to use and how to apply it.

Write us NOW for your copy.

Profitable dealerships open; inquire now!

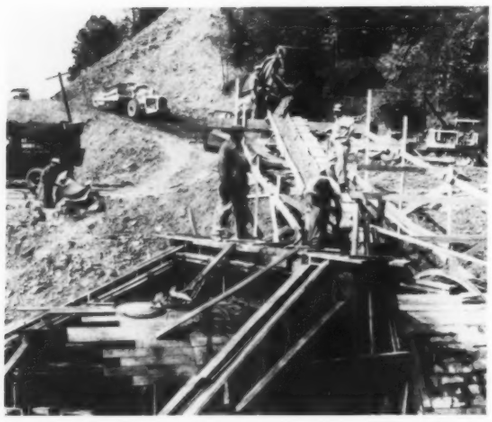
VICTOR for hardfacing

VICTOR EQUIPMENT COMPANY

ALLOY ROD AND METAL DIVISION

13808 E. Imperial Highway, Norwalk, Calif. • Wakita, Oklahoma

For more facts, use Request Card at page 18 and circle No. 254



Pouring concrete for one of 3 sub-surface structures designed to carry off surplus water from the re-channeled creek.

Crooked Creek was

When a creek obstructs a 3½-mile road project, a good way out is to move the creek. That's exactly what S. Gavlik, Contractor of Glenwillard, Pa., is doing in order to re-locate Rt. 422 near Indiana, Pa. The entire project, let under the Federal Highway Program, involves 300,000 cubic yards of classified excavation and includes three sub-surface concrete structures to carry off surplus water from the creek.

The Gavlik people know they can depend on

in the way...Gulf helps Gavlik move it

Gulf for top quality products and prompt service. Says A. R. Tietjen, Superintendent, "We're extremely well satisfied with Gulf. Can't beat the products . . . or the service. We like the way Gulf has consolidated its product lines, too. This sure cuts down chances of using the wrong lubricant."

Gulf can play an important role on your construction jobs, too. There are 1500 strategically located Gulf warehouses ready to supply you with a dependable flow of job-engineered fuels and lubricants. A Gulf Sales Engineer, backed by 1300 scientists and technicians, is your direct link with the latest developments in petroleum science. He will provide, at no cost, expert advice on the use of petroleum products. For full information on how Gulf can serve you, call your nearest Gulf office. And for your maintenance crew, get a copy of the revised edition of "Contractors Guide." Just mail the coupon.

Left to Right: A. Tietjen, Superintendent; R. S. Garrison, Assistant Superintendent; H. H. Hossler, Gulf Representative; S. Gavlik, General Contractor.

Letourneau-Westinghouse 18-yard scrapers making cut for new right of way on relocation of Rt. 422 near Indiana, Pa. S. Gavlik, Contractor on the job, was faced with a creek that blocked the right of way. His solution: move the creek.

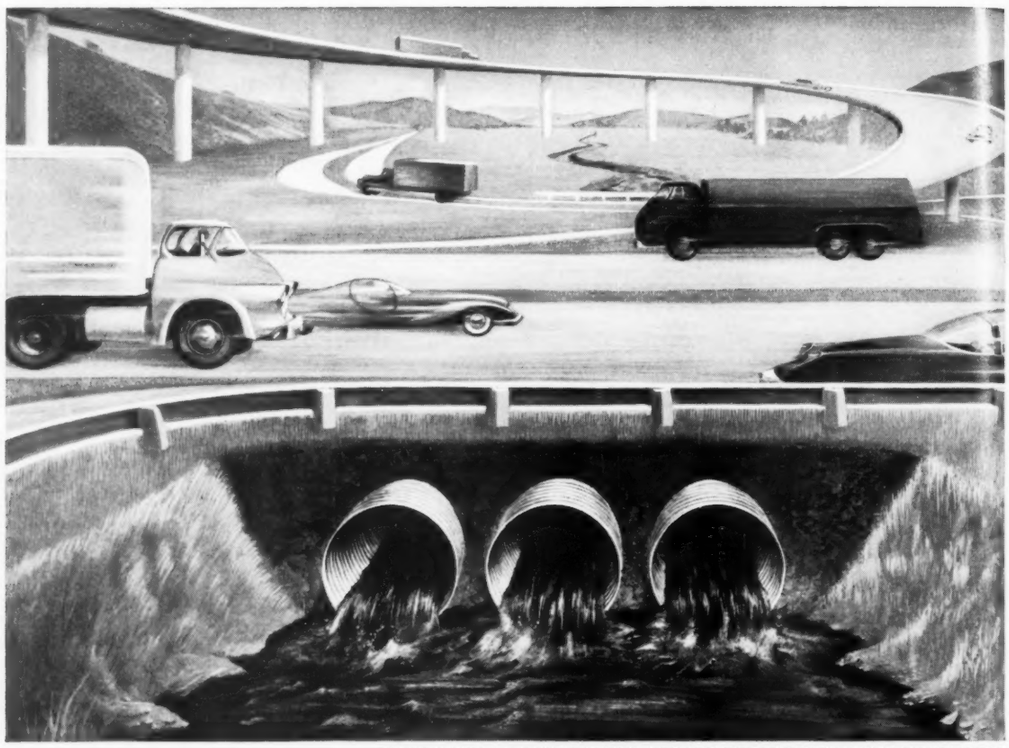
GULF OIL CORPORATION
Department DM, Gulf Building
Pittsburgh 30, Pa.

GULF

☐ Send copy of "Gulf and Your Business"
☐ Send copy of the new "Contractors Guide"
(Lubrication and maintenance manual)

Name_____
Title_____
Company_____
Street Address_____
City_____ Zone____ State_____

SP-9224



WHEELING CORRUGATED GALVANIZED METAL CULVERT PIPE IS MANUFACTURED TO COMPLY WITH FEDERAL AND ALL STATE HIGHWAY SPECIFICATIONS.

Low cost-per-year of Wheeling Corrugated Metal Pipe means years of highway economy

Saving public tax dollars is second nature to Wheeling Metal Pipe. Its low first cost . . . plus lowest cost-per-year . . . can't be equalled by rigid types. Unexcelled, too, is the flexible strength of Wheeling Metal Pipe . . . its durability through decades of weather and traffic torture . . . the galvanized steel from which it's made.

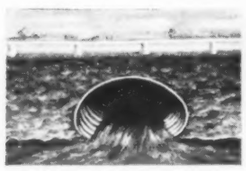
Saving time for road-builders is another specialty of Wheeling Metal Pipe. The easy-to-handle sections drop into place quickly . . . fit together with the help of simple hand tools and manual labor. Light and long, they're easy to ship by truck or train—a big help in meeting the tight schedules of today's highway-building.

All of which means better, longer-lasting highways . . . and at lower cost.

Wheeling Metal Pipe or Pipe Arch, in Copper-bearing Steel or Copper-bearing Pure Iron, plain galvanized or bituminous coated (with or without paved invert) comes in a wide range of gauges and diameters. Call the Wheeling warehouse, sales office or culvert plant nearest you. Wheeling Corrugating Company, Wheeling, W. Va.

Wheeling
CORRUGATING COMPANY

WHEELING CORRUGATING COMPANY—IT'S WHEELING STEEL

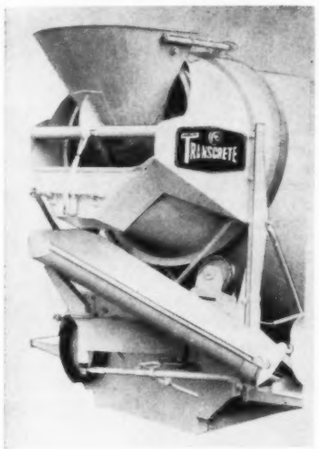


Where headroom is limited, Wheeling Pipe Arch is recommended. The increased area permits more rapid drainage.

Look how quickly and easily men work with Wheeling Metal Pipe. This, too, means lower costs, faster installation.

Wheeling warehouses, sales offices or culvert plants are in Atlanta, Boston, Buffalo, Chicago, Columbus, Des Moines, Detroit, Houston, Kansas City, Louisville, Madison, Martins Ferry, Minneapolis, New Orleans, New York, Peoria, Philadelphia, Richmond, St. Louis.

For more facts, use Request Card at page 18 and circle No. 356



Several new improvements for truck mixer line

A new all-weather water system and added hopper refinements are among the new features offered in the 1958 Transcrete truck mixer available from the Construction Machinery Co.

The system's water pump has a new ceramic-faced seal for leakage protection and longer trouble-free operation. The water controls are placed at the open end of the mixer. This, with the water gauge moved for line-of-sight viewing from the rear of the machine, gives the operator easy manipulation of all controls and assures accurate water measurement from a single position.

Redesigned supports on the hopper offer maximum rigidity with minimum overhang. The restyled positioning stop on the swing-out hopper has a wider backing pad for added strength. A new heavier section pipe connects the hopper supports; this pipe is now stable and forms an independent unit that does not move with the swing-out hopper.

The 1958 Transcretes are available in five sizes, 4 to 7 yards, with separate engine drive; and in four sizes, 5 to 7 yards, with truck engine drive.

For further information write to the Construction Machinery Co., Dept. C&E, 447 Vinton St., Waterloo, Iowa, or use the Request Card at page 18. Circle No. 92.

Traction-flotation wheels for wheel-type tractors

Traction-flotation wheels for almost all makes of tractors are available from the Freeman Loader Corp.

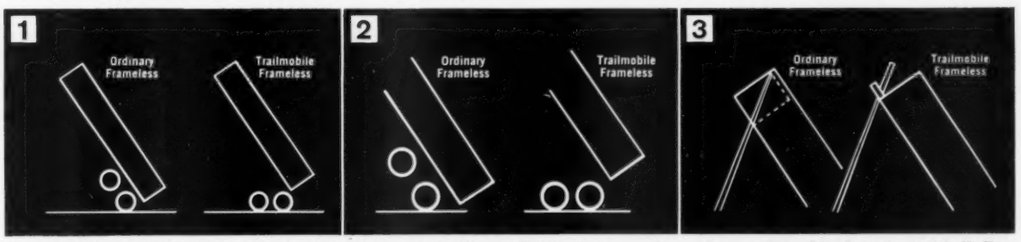
Designated Xtra Trax, the wheels are designed to give positive crawler-action to wheel-type tractors, and to reduce slippage under any soil conditions. They eliminate the need for wheel weights or fluid in tires, and are of steel construction. Attachment is easy, and the wheels need not be taken off for operation on cement or surfaced roads, according to the manufacturer.

For further information write to the Freeman Loader Corp., Dept. C&E, Blair Pike Road, Peru, Ind., or use the Request Card at page 18. Circle No. 71.

Ready for joint sealing on the Air Force Base at Columbus, Miss., are four 36-hp C-362 Clipper concrete saws. Contractor for the job is Tombigbee Constructors, Columbus. Project manager Harry Taylor and saw foreman Joe Hoehne report that the fast-cutting self-propelled concrete saws are cutting to a depth of 3 1/16 inches, in gravel aggregate, using the Clipper GreenCon C-810 and C-813 reinforced abrasive blades. For further information write to the **Clipper Mfg. Co.**, Dept. C&E, Suite 149, 2800 Warwick, Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 45.

NEW TRAILMOBILE FRAMELESS DUMP TRAILER

allows up to 3000 lbs. extra payload · offers five unbeatable features



More stability—*Both axles, all 8 wheels, stay on the ground* throughout dumping cycle, whether spreading or stockpiling.

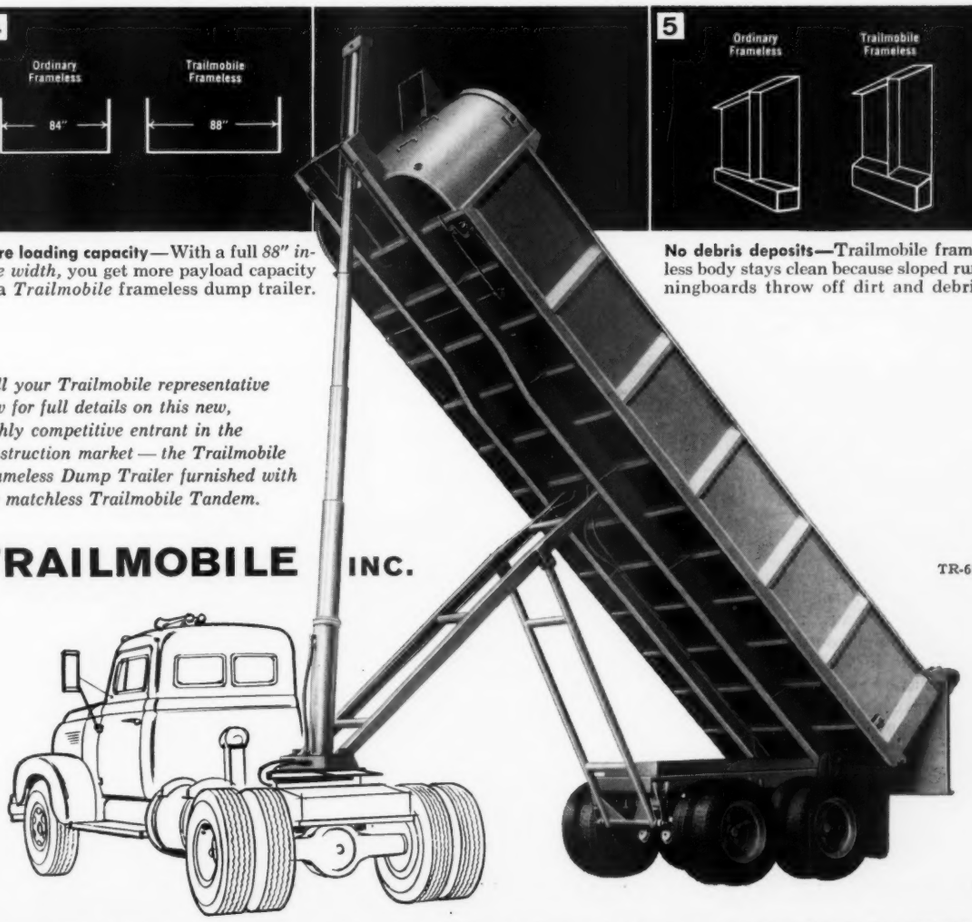
Better stockpiling—Spill point *remains 43¼" high* while piling—almost double that of ordinary frameless dumps.

Extra cube—Newly patented *bail* eliminates space consuming doghouse . . . lowers lift point for added stability.

More loading capacity—With a full *88" inside width,* you get more payload capacity in a *Trailmobile* frameless dump trailer.

No debris deposits—Trailmobile frameless body stays clean because sloped runningboards throw off dirt and debris.

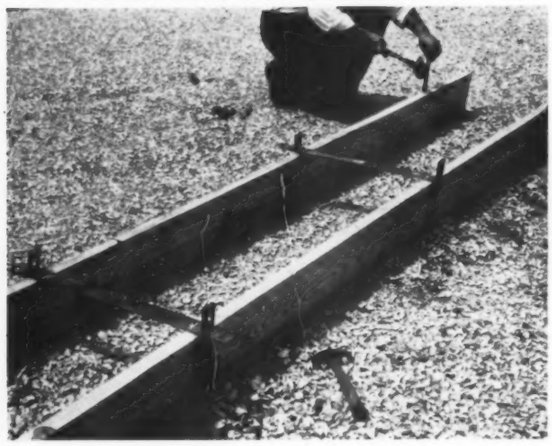
Call your Trailmobile representative now for full details on this new, highly competitive entrant in the construction market — the Trailmobile Frameless Dump Trailer furnished with the matchless Trailmobile Tandem.



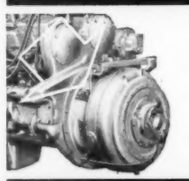
TRAILMOBILE INC. TR-668

CINCINNATI 9, OHIO • LONGVIEW, TEXAS • SPRINGFIELD, MISSOURI • BERKELEY 10, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 257



A steel stake bar to go with its recently introduced steel stake is offered by the Symons Clamp & Mfg. Co. The bar is a steel unit which offers six positions for holding steel stakes in positive distances apart—distances varying in multiples of 2 inches—from 16 to 24 inches, and is said to be particularly adapted to low wall forming. Its flat surface, with nail holes spaced one inch apart, makes it easy to drive and nail firmly with no possibility of rolling, according to the manufacturer. A pullout hole at the top permits fast removal with no special tool. For further information write to the **Symons Clamp & Mfg. Co.**, Dept. C&E, 4249 W. Diversey Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 10.



Left: An array of Caterpillar-built machines working on the first portion of the Federal-Aid-Highway program as it opened near St. Charles, Missouri. Torque converter components for the D8's are furnished by Twin Disc.

Below: A Caterpillar D9 Tractor, equipped with torque converter drive utilizing Twin Disc components, 'dozes its way through heavy rock.

How Cameron, Joyce & Company opened the Federal-Aid Highway program . . . with torque converter equipped D9's and D8's

When Cameron, Joyce & Company began moving earth for a 2.8-mile stretch of four-lane highway near St. Charles, Missouri, this well-known Keokuk, Iowa, contracting firm provided the kick-off for the greatest construction project ever known!

It was a big job . . . and it called for big equipment. So Cameron, Joyce & Company brought in its torque converter equipped Caterpillar D9 and D8 Tractors. According to Tench T. Gammon, the firm's treasurer, here's why:

"The torque converter equipped machine outproduces a comparable mechanical drive unit by about 20 per cent. On top of that, it improves service life by about the same percentage . . . thanks to the cushioning effect of the converter's fluid connection. Another important feature is its greater ease of operation, for little or no driver fatigue."

Caterpillar offers both its D9 and D8 Tractors with torque converter drive or direct drive . . . and standardizes on Twin Disc components for the torque converter versions of these two tractors.

In all three leading makes of crawler tractors, whether the torque converter drive is standard or optional, the components are furnished by Twin Disc. Specify a torque converter drive in your next machine. See for yourself how they pay for themselves on every job.

Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
TWIN DISC
Torque Converters

For more facts, use Request Card at page 18 and circle No. 258

All-electric computer is aid in general accounting

The Monrobot IX, an all-electric calculating computer that is completely housed within a single desk, is announced by the Monroe Calculating Machine Co.

Although designed primarily for billing applications, the flexible program control of the machine permits its use for many other general accounting functions, the company reports. Read-in and read-out mechanism is an electric typewriter with conventional keyboard, which can be operated by any typist.

The Monrobot IX will not only print results instantly with the flick of a switch, but will store individual answers for end-of-the-day totals, and store daily totals for recall at any time.

Eight programs of 52 instructions each are available. The operator selects the various programs by merely depressing the appropriate keys. Sixteen selector keys are available on the keyboard. The machines are programmed after careful analysis of a particular company's billing requirements.

For further information write to the Monroe Calculating Machine Co., Dept., C&E, 555 Mitchell St., Orange, N. J., or use the Request Card that is bound in at page 18 of this issue. Circle No. 26.

New diesel truck series for dump, mixer service

Diamond T announces its 923 diesel series for dump and mixer service, as well as for its primary use as a highway tractor. The new line features a payload weight of 18 to 22 tons.

Gross vehicle rating of the standard model is 29,000 pounds, but with optional oversize front axles and tandem rear axles, gvw is as high as 60,000 pounds, the company reports. A choice of three front axle positions is offered.

Transmission choices consist of the 5-speed Fuller 5C720, the Fuller R96 or R960 10-speed Roadranger, the 4-speed Spicer 8041, and the 5-speed Spicer 8250 series with either cast iron or aluminum cases. The Spicer 7231 B or D auxiliary transmissions

Featuring a payload weight of 18 to 22 tons, Diamond T's new 923 series is designed for dump and mixer service, as well as for its primary use as a highway tractor. Several transmission choices are available.

are also available and required for dump service.

Power plant for the 923 series is the new Cummins HF-6-B diesel engine.

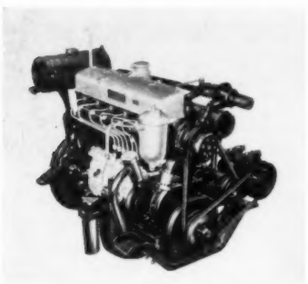
A frame that is exceptionally rugged while holding weight to a minimum is claimed by the manufacturer. The company's Full Vision steel safety cab is standard on all models.

For further information write to the Diamond T Motor Car Co., Dept. C&E, 4401 W. 26th St., Chicago 23, Ill., or use the Request Card at page 18. Circle No. 22.

German diesel engine now available in U.S.

The availability in the United States of the Model OM312 Mercedes-Benz diesel engine is announced by the Utica Bend Division of the Curtiss-Wright Corp.

Manufactured in the 50 to 79-hp range from 1,400 to 2,400 rpm, the unit is a 6-cylinder, vertical-in-line, 4-cycle, liquid-cooled engine with a compression ratio of 19.5 to 1. It weighs 990 pounds and has over-all dimensions of 41 inches high, 36 inches long, and 28 inches wide. The combustion system is the Daimler-Benz pre-combustion chamber type, utilizing Robert Bosch injection pumps and nozzles.



Quick starting in low temperature weather is possible through the use of glow plugs which are standard equipment.

The OM 312 is available in either heat-exchanger or radiator-cooled design, and is said to have a wide variety of applications.

For further information write to the Utica Bend Division of the Curtiss-Wright Corp., Dept. C&E, 50500 Mound Road, Utica, Mich., or use the Request Card at page 18. Circle No. 82.

Several benefits claimed for stock shear heads

A new development in shear-head design said to offer substantial savings in formwork, better utilization of floor space, and height-reducing advantages, is announced by the Shlagro Steel Products Corp.

Shlagro shear heads, used in conjunction with a reinforced-concrete column, a rolled structural steel column, or the Shlagro square column, make possible greater flexibility of design in both conventional and unusual projects, according to Shlagro.

Mushroom heads and drop panels reportedly are eliminated by these stock shear heads, allowing the steel to be completely imbedded in the normal floor slab. The integrating of the Shlagro shear-head system and a Shlagro or rolled column is said to allow multistory column erection in advance of lower floor slab pouring. Future story addition or building extension is extremely practicable with the system, the manufacturer reports.

For further information write to the Shlagro Steel Products Corp., Dept. C&E, 84 Washington Ave., Somerville, Mass., or use the Request Card at page 18. Circle No. 19.

NOW TRANSISTORIZED

power supply · speaker · microphone

MOTOROLA T-POWER 2-WAY RADIO

Improved Performance with Lower Operating Cost

Already famous for the lowest maintenance and operating costs in the mobile 2-way radio field, Motorola radio is an even better investment now—with T-POWER. The vibrator is gone! . . . replaced by rugged, long life transistors. Reduced "down-time", lower maintenance, and greatly improved performance *all* result from this new development. The transistorized POWER VOICE Speaker is 10 times more powerful than conventional speakers . . . talks *through* noise and can be heard hundreds of feet away from the vehicle. The transistorized Dynamic Microphone gives unprecedented voice clarity and greater communications range.

New Mounting Flexibility with Plug-In Control Head . . . Same Basic Unit can be Used for Front or Trunk Mounting

With the T-POWER radio you are no longer restricted to one type of mounting. Install the complete radio, with drawer unit and plug-in control head, for under-dash mounting. For rear mounting, the same basic drawer unit can be installed in the trunk and connected by cable to a dash-mounted control head. And—the same basic drawer unit can be interchanged with the equivalent Motorola Twin-V trunk mount models operated from a 12-volt negative ground source.

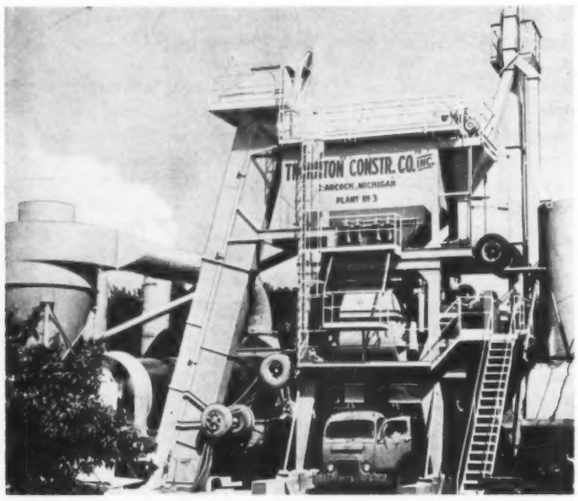
Get all the facts. Write now for literature with complete information.

MOTOROLA · TRANSISTOR POWER 2-WAY RADIO · POWER

Transistorized Power Supply for receiver and 25-watt transmitter.

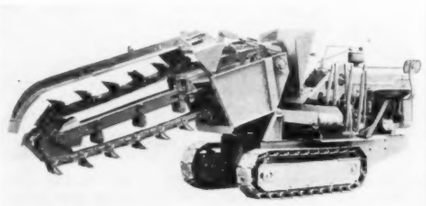
MOTOROLA Communications & Electronics, Inc. · 4501 Augusta Blvd., Chicago 51, Illinois · A Subsidiary of Motorola, Inc.

For more facts, use Request Card at page 18 and circle No. 259



Nineteen miles of asphalt paving on U. S. 2, between Naubinway and Brevort, Mich., was handled by this Madsen Model 481, 6,000-pound-batch-capacity asphalt plant. The Thornton Construction Co., Inc., of Hancock, Mich., contractor for the job, reported a production rate of 175 tons per hour on the base course, with a mixing cycle of 63 seconds. On the top course, with a 74-second mixing cycle, the plant turned out 140 tph of close specification mix. For further information about the Model 481, write to the Madsen Works, Construction Equipment Division, **Baldwin-Lima-Hamilton Corp.**, Dept. C&E, 14120 E. Rosecrans Ave., La Mirada, Calif., or use the Request Card at page 18. Circle No. 96.

Compact new trencher weighs only 6,750 pounds



The Parsons Model 77 ladder-type Trenchliner digs to a 5-foot depth at 6 to 18-inch widths. Sixteen digging feeds—from 4.4 to 181 inches per minute—are available. A new self-cleaning bucket line offers speeds from 38½ to 246 fpm.

Compactness in design, while incorporating all of the features found on larger machines, is one of the advantages listed for the Parsons Model 77 ladder-type Trenchliner.

Specifications on the Model 77 include a 5-foot 10-inch roading height, 5-foot 5-inch digging height, 4-foot width, and a total transporting weight of only 6,750 pounds.

The unit can dig to a depth of 5 feet at 6 to 18-inch widths. Sixteen digging feeds—from 4.4 to 181 inches per minute—are available. Optional sprocket feeds also total sixteen, ranging from 6.2 to 252 inches per minute.

The unit's new self-cleaning bucket line ranges in speed from 38½ to 246 fpm. Conveyor belt speeds are from 75 to 480 fpm. The conveyor is shiftable and reversible so that spoil can be deposited on either side of the trench. The boom is of the telescopic type for depth variation.

Powered by an International Harvester U-175 engine, the Model 77 has four forward speeds: .375, .778, 1.42, and 2.41 mph. Reverse speed is .307 mph.

For further information write to the Parsons Co., Division of Koehring Co., Dept. C&E, Box 431, Newton, Iowa, or use the Request Card that is bound in at page 18 of this issue. Circle No. 100.

ROCKFORD

MORLIFE® CLUTCHES

Control Power Better in the Heaviest-Duty Machines

ROCKFORD Over-Center CLUTCHES, equipped with MORLIFE clutch plates, provide 100% more torque grip than previous type clutches of equal size. This permits the use of smaller diameter clutches. Easier operation is accomplished by reducing the required engaging pressure. 50% better heat disposal avoids down-time caused by burned or warped plates. Numerous field records prove that MORLIFE clutches operate 400% longer without plate replacement or adjustment. Let these NEW type clutches help improve the operation of *your* heavy-duty machines.

Small Spring Loaded

Heavy Duty Spring Loaded

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Heavy Duty Over Center

Power Take-Offs

Speed Reducers

SEND FOR THIS HANDY BULLETIN
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

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Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

For more facts, use Request Card at page 18 and circle No. 260

SPEED DIGGING JOBS

with specialized Brunner & Lay CLAY SPADES

Brunner & Lay Clay Spade for digger

Brunner & Lay Clay Spade for breaker

These remarkably lightweight, well-balanced Brunner & Lay Spades, for clay diggers, help reduce operator fatigue and increase the cubic yards of material removed per day. These advantages, plus durability have placed Brunner & Lay Clay Spades at the top of the wanted list by management and operators. Sizes to fit all standard diggers. Delivered by dealers nation-wide. Send for NEW #756 catalog. Call our nearest plant. Brunner & Lay, Inc. 9300 King St., Franklin Park, Ill. Plants and warehouses: Philadelphia; Asheville; Birmingham; Dallas; Denver; Los Angeles; Portland, Ore.; Montreal.

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For more facts, use Request Card at page 18 and circle No. 261

Accurate measurements reportedly can be taken conveniently from a moving vehicle with the Rolatape Model 400 measuring wheel with extended handle. The specially designed handle enables the driver to guide the measuring wheel with ease while operating the car at a moderate speed, according to the manufacturer. Measurements are recorded in feet automatically up to a distance of nearly 19 miles. A special stand enables the operator to park the measuring wheel in an upright position without leaving the car. For further information write to **Rolatape, Inc.**, Dept. C&E, 1741 14th St., Santa Monica, Calif., or use the Request Card at page 18. Circle No. 6.

Diamond blade good for most type refractories

The Clipper Mfg. Co. offers its Model CD-7245-3 diamond blade.

A 3/16-inch diamond depth blade, the unit is said to be especially suited for cutting of concrete products containing such aggregates as slag, pumice, expanded shale, cinder, crushed stone, and river gravel. Excellent results have also been obtained with the CD-7245-3 on almost every type of basic refractory, according to the manufacturer.

For further information write to the Clipper Mfg. Co., Dept. C&E, Suite 149, 2800 Warwick, Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 88.

HOW TO "BELT" TIE-WIRE PROBLEMS

When workers use CF&I Annealed Cal-Tie Wire in the handy, belt-borne dispenser, the weight and worry of clumsy shoulder coils is eliminated. There are no loose wire ends—hence no danger of facial scratches or costly eye injuries.

With this modern method of carrying re-bar tie wire, both hands are free—wire can't kink, tangle or catch on protruding objects, thus work in close quarters is easy and safe.

Your workers will like the convenience and safety of Cal-Tie Wire and you will appreciate its efficiency and economy. Cal-Tie Wire Coils weigh approximately four pounds and the wire is available in 14 through 20 gage. Why not get full details now from the nearest sales office listed below.

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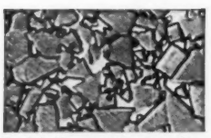
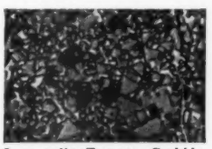
Longer bit life—with *new* Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide. (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



Low quality Tungsten Carbide. (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give you more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

THESE STANDARD SIZES ARE AVAILABLE

	THREAD	DIAMETERS AVAILABLE (IN INCHES)													
SHOULDER TYPE	⅞" F	1½													
	1" H	1½	1⅝	1¾	1⅞										
	1 3/16" D					2	2⅛	2¼	2⅜	2½	2¾	3			
	1 11/16" K											3	3½	4	4½
BOTTOMING TYPE	1¼" Rope				1⅞	2		2½		2½					
	1½" Rope									2½	2¾	3	3½	4	
	2" Rope												3½	4	4½	5
	400					2		2½		2½					
	600									2½	2¾	3	3½		

Shaded area indicates X-Bits

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—and Sandvik Coromant extension steel equipment.

Write, phone or cable today for further details to any of the addresses below:

Atlas Copco

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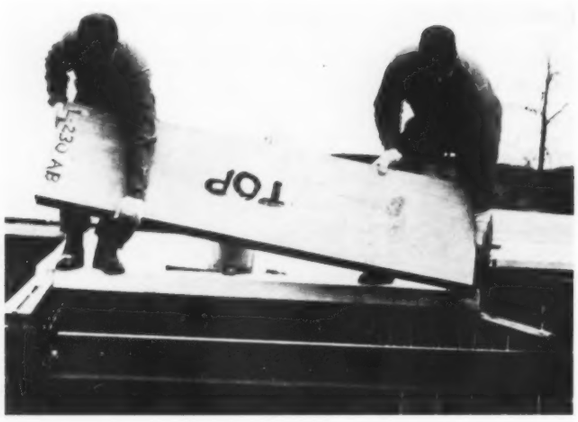
ATLAS COPCO PACIFIC *930 Brittan Ave., San Carlos, Calif. Phone Lytell 1-0375*
ATLAS COPCO CANADA *Montreal Airport, Quebec. Phone Melrose 1-5571*
ATLAS COPCO MEXICANA *Apartado Postal 56, Torreón, Coahuila. Phone 39-07* DIST.70

For more facts, use Request Card at page 18 and circle No. 263



Workmen install Calsi-Crete slabs as roof decking. According to the manufacturer, two men can do the job quickly and efficiently.

New building material reported highly versatile

Calsi-Crete, a new building material described as a lightweight cellular concrete, is announced by the Continental Materials Corp.

Among the many properties which Calsi-Crete reportedly combines are high structural strength, unusual fire resistance, high insulation value, dimensional stability, and good acoustical values. It resists frost action, has extremely low wetting and drying movements, is vermin-proof and cannot rot. Calsi-Crete can also be cut, sawed, and nailed, and provides an excellent key for plastering and rendering, according to the manufacturer.

The heaviest version of the new material is less than one-third as heavy as normal concrete. When the density is lower, the difference in weight between the two materials becomes more pronounced.

Calsi-Crete can be used where load-bearing properties are necessary and, equally well, for non-load-bearing and insulating purposes. The material boasts densities up to 55 pounds per cubic foot.

Currently offered in roof planks measuring $3\frac{1}{2} \times 20 \times 80$ inches, it soon will be available for many other applications, according to the manufacturer.

For further information write to the Continental Materials Corp., Dept. C&E, 4401 W. North Ave., Chicago, Ill., or use the Request Card at page 18. Circle No. 58.

Battery life doubled by test-proved additive

A battery additive said to at least double the operating life of mechanically sound wet cell batteries is available from Pioneers, Inc.

Designated AD-X2, the additive, a white powder, effects a decrease in sediment, lower temperatures, higher conductivity of the electrolyte, less need for additional water, and a higher charging capacity, according to tests conducted by the Massachusetts Institute of Technology.

Further tests, run by the U. S. Testing Co., Inc., indicate that the powder in no way harms the battery, reduces shedding of active material, and increases discharging as well as charging efficiency.

For further information write to Pioneers, Inc., Dept. C&E, 2411 Grove St., Oakland 12, Calif., or use the Request Card that is bound in at page 18. Circle No. 84.

Portable asphalt plant for small paving jobs

The Model PM-430 Patchmobile, a portable hot-asphalt plant featuring low aggregate charging height and high mixed material discharge height, is available from the Wylie Mfg. Co. The unit is designed for small paving jobs, repair, and maintenance.

According to the manufacturer, the basic large plant principle of a rotary dryer for drying aggregate and separate pugmill for mixing aggregate and asphalt, as well as hot asphalt storage, is incorporated in this single trailer unit.

When operating as a mobile unit, the plant is towed by the dump truck hauling the sand and gravel for the mix. Material is shoveled from the truck into the charging hopper, is then fed by the reciprocating feeder into the dryer, and passes through

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This catalog should be in the hands of everyone responsible for maintaining off-highway tires. Packed with data, specifications—full lines of all the latest, most practical valves, tools, fittings—easy to find information. If you haven't already received your copy, send for this catalog today.

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For more facts, use coupon, or Request Card at page 18 and circle No. 264

This Wylie Model PM-430 Patchmobile combines a rotary dryer for drying aggregate and separate pugmill for mixing aggregate and asphalt, as well as hot-asphalt storage, all in a single trailer unit. The machine is designed for small paving jobs.

the dryer into the batching hopper. When the machine operator discharges the material in the batching hopper into the pugmill, a pre-set amount of asphalt is automatically sprayed into the mix. The mixed material from the pugmill can be discharged into the shoveling pan, onto the pavement, or into a wheelbarrow, as desired.

When operating as a stationary plant, the low charging height of 64 inches eliminates the need for an elevator.

The plant consists of an aggregate charging hopper with reciprocating feeder, rotary dryer with low-pressure burner heating system, hot aggregate batching hopper, 250-gallon asphalt storage tank, pump-driven asphalt metering system, and a heated and single-shaft pugmill driven by a totally enclosed oil bath gear box. The machine is also available with a twin-shaft pugmill.

The unit measures 183 inches in over-all length, is 85 inches wide, and weighs approximately 4,500 pounds.

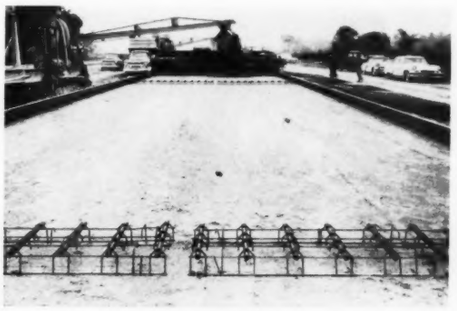
For further information write to the Wylie Mfg. Co., Dept. C&E, P. O. Box 7086, Oklahoma City, Okla., or use the Request Card at page 18. Circle No. 81.

Offer combination benders for hard and soft tubing

Combination tube benders of a new, improved design, said to bend both hard and soft tubing and handle from 2 to 7 sizes, are offered by The Imperial Brass Mfg. Co. The size of tubing to which the benders may be applied ranges from ¼ to ⅞-inch OD.

The new benders reportedly make bends up to 180 degrees, and can be used for copper, aluminum, steel, or stainless steel tubing. Benders for four or more sizes of tubing are furnished in metal kits.

For further information write to The Imperial Brass Mfg. Co., Dept. C&E, 6300 W. Howard St., Chicago 31, Ill., or use the Request Card at page 18. Circle No. 7.



A dowel basket assembly manufactured by the Universal Form Clamp Co. is shown in use on the Illinois Toll Road job. Contractor for the depicted work is the Hoyle-Newberg Construction Co. of Chicago. According to Universal, rugged construction maintained the dowels parallel and at the proper elevation for the slab. Completely assembled and welded units were furnished, enabling workmen to lay baskets directly on the subgrade, recdy for use. For further information write to the **Universal Form Clamp Co.**, Dept. C&E, 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 63.

What's in a name PLATE?

PLENTY
When the name's McKISSICK

Drop forged permanently affixed plates on all McKissick crane and construction blocks provide EASILY ACCESSIBLE PERTINENT INFORMATION.

Your record of the RATED CAPACITY, SIZE, TYPE AND SERIAL NUMBER of every crane and construction block at a glance — and most important of all — this name plate is your assurance of Superior McKissick Quality.

Write for catalog of all McKissick Products.

McKISSICK
McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

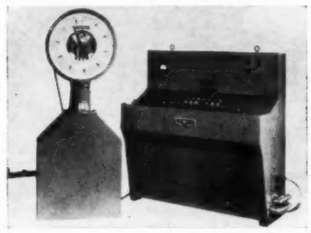
For more facts, use Request Card at page 18 and circle No. 265

An all-aluminum, all-welded rock body with a 36-cubic-yard heaped capacity is announced by The Heil Co. Other unusual features include rounded interior corners to prevent adhesion of sticky materials, and heated floor construction. According to the manufacturer, the light weight of the unit is expected to increase the speed of truck operations, as well as reduce tire wear and gas consumption. For further information write to **The Heil Co.**, Dept. C&E, 3003 W. Montana Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 42.

Master console announced for portable batch plant

Automatic cement weight cutoff, controlled by a pre-set dial reading in pounds, is one of the features of the completely plug-in master console for a portable batching plant, announced by the Gemco Electric Co.

According to the manufacturer, the master console is the nerve center



and distribution point for all electric, air, and hydraulic power used in the plant. Mixers, gates, conveyors, and pumps are controlled by push buttons and valves within arm's length of the operator.

Field wiring reportedly consists only of connecting incoming power to the main circuit breaker provided in the console. Lighting distribution circuits, solenoid valves, motors, air and hydraulic supply lines are quickly connected and disconnected with positive locking receptacles, the company reports.

Complete control systems for both portable or permanent batching plants are designed to required specifications.

For further information write to the Gemco Electric Co., Dept. C&E, 25685 W. Eight Mile Road, Detroit 40, Mich., or use the Request Card at page 18. Circle No. 47.

New photocopying unit said to boost production

A new electrostatic copying unit is announced by the Haloid Co. Designated XeroX Model 1218, the equipment reportedly reduces an engineering drawing as large as 24×36 inches onto a 12×18-inch paper master, and makes possible 100 or more low-cost copies in about five minutes.

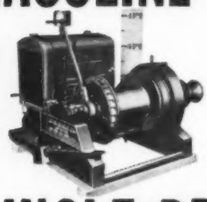
Medium-sized drawings (12×18 inches) may be copied size to size, while several small drawings may be copied at a time in their original size or enlarged individually to 12×18 inches. Used masters may be filed for runoff of copies when needed.

According to the manufacturer, Xerography requires no intermediate film negative, sensitized papers, water, or liquid chemicals. In addition, the Model 1218 permits the use of precut rather than roll paper, a feature obviating hand-shearing.

The XeroX Model 1218 equipment consists of a copying camera, charge unit, developing tray, cleaning tray, transfer unit, and a fuser for making permanent the image on the paper master.

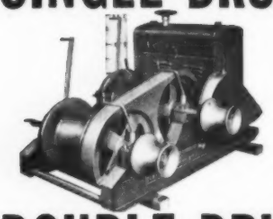
For further information write to the Haloid Co., Dept. C&E, 35 Haloid St., Rochester 3, N. Y., or use the Request Card at page 18. Circle No. 3.

GASOLINE HOISTS



The economical hoist for the economical job. Duty: 1000 lbs. to 5000 lbs. at 150-175 FPM. Model—No. 140 Single Drum—

SINGLE DRUM HOIST



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Safe worm or spur gear design. Sizes for 400 to 40,000 lb. load. No. 110 shown.

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Models from 40 to 400 h.p., gas or diesel. Series 0-4 illustrated, 40-50 h.p.

Harbormaster . . .
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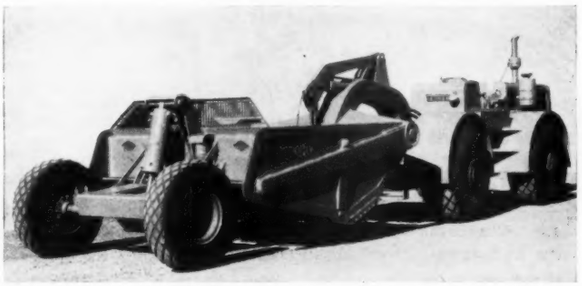
If you need easily installed power, better steering control, safety in shallow water, easier maintenance, more efficient performance, simpler hull design, more cargo space, bigger payloads, or simplified crew operation . . . you should investigate the benefits of Harbormaster Outboard Propulsion and Steering. Harbormaster is a complete power and steering package. It is powerful and highly maneuverable and has wide application in shallow or deep water, for coastwise service as well as in harbors, lakes, canals, and rivers.

Send for catalog giving complete information and showing Harbormasters in action . . . or if you have a problem our marine architect will make recommendations without obligation.

MURRAY & TREGURTHA, Inc.
44 Hancock St., Quincy 71, Massachusetts

For more facts, circle No. 269



One of two new scrapers designed for high-speed operation with Wagner TR9 and TR14 tractors, this Ateco Model H87 has a capacity of 11 yards heaped. An "air cushion" accumulator built into the hydraulic system is said to absorb the shock of high-speed loading, yet provide positive control of cutting and spreading depth.

New scraper designed for high-speed operation

Especially designed for high-speed operation with Wagner TR9 and TR14 tractors, two new hydraulically controlled scrapers are available from the American Tractor Equipment Corp.

A feature stressed by the company is the Ateco "air cushion" accumulator built into the hydraulic system. This absorbs the shocks of high-speed loading, yet provides positive control of cutting and spreading depth. A single front cylinder in the head frame raises and lowers the front apron and controls the rear apron discharge. A second cylinder on the rear hinged truck accurately controls cutting and spreading depth.

The Ateco design reportedly eliminates overhead structures and auxiliary bowl-carrying frames.

Improved traction for fast loading and easy handling for high travel speeds is assured by the easily mounted universal hitch which transfers the scraper weight to the tractor rear driving wheels.

Two models are available: the H87, with an 8¼-yard-struck and 11-yard-heaped capacity; and the H97, with 9½-struck and 12-yard-heaped capacity. Both are equipped with 16.00×20 tires.

For further information write to the American Tractor Equipment Corp., Dept. C&E, 9131 San Leandro Blvd., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 89.

Tire tread depth gage helpful in maintenance

The Model 5096 tread depth gage, a precision instrument designed to measure the tread depth of tires used on trucks and off-the-road equipment, is offered by the Dill Mfg. Co.

In addition to contributing to the proper maintenance of these tires, the instrument provides an accurate means for gaging treads when mating dual tires.

The gage is graduated in 1/16-inch increments up to five inches. It is of all-metal construction, with a handy pocket clip on the case.

For further information write to the Dill Mfg. Co., Dept. C&E, 700 E. 82nd St., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 41.

Lead and compass pointer operates automatically

A new lead and compass pointer for draftsmen and engineers is announced by the W. H. Behrens Co.

Designated Point Perfect, and designed for clutch lead type pencils, beam and other type compasses, the unit sharpens leads instantly, with one-hand operation.

According to the manufacturer, a slight touch of lead against the cutters trips an electric switch which operates the sharpener as long as the lead is applied. The device instantly points lead to a 12-degree included angle, it is claimed.

For further information write to the W. H. Behrens Co., Dept. C&E, 2302 St. Clair St., Racine, Wis., or use the Card at page 18. Circle No. 4.

Never before has Chevy been so right for big construction jobs!

Here's a truck specially designed to take to your kind of work like a duck takes to water! It's Chevrolet for '58 with new hustle, muscle and style that mean money in your pocket!

As you can see, Chevy's a honey of a truck this year, and that handsome, broad-shouldered '58 appearance only hints at the host of new and improved features that are ready to put you dollars ahead in the years to come. *Here's a truck ideally suited for haulers in your line of work.* Here's new styling to help build your business prestige every day in the week. And what workers these new heavyweights are! There's new power to whip mammoth hauls from the industry's newest engine, the 230-h.p. Workmaster V8* with revolutionary Wedge-Head design . . . or from the durable 175-h.p. heavy-duty Super Taskmaster V8 in Series 70 and 80 models. G.V.W.'s go all the way up to 36,000 lbs. (with Triple-Torque tandem) for big, profitable payloads. And these trucks come equipped with the toughest of big truck chassis components, either as standard equipment or as extra-cost options: cast spoke or disc wheels, air-hydraulic brakes, full-air brakes or big Hydrovac power brakes, and smooth Synchro-Mesh transmissions built to meet your needs precisely.

There are many such reasons why Chevy's never been *so right* for your work—many more reasons why you'll want to see your Chevrolet dealer soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**Featured in Series 90 and 100.*

CHEVROLET

NEW CHEVROLET TASK·FORCE 58 TRUCKS

For more facts, use Request Card at page 18 and circle No. 270

Offered as an attachment for the Econmobile material-handling vehicle, a 12-foot 6-inch crane hoist provides a hoisting height of 32 feet in the retracted position. In the extended position the unit can hoist 28 feet off the ground. Maximum capacity of the unit is 1,500 pounds.

Crane attachment for material-handling unit

A crane hoist attachment for use with its Econmobile is available from the American Road Equipment Co.

The new hoist is 12 feet 6 inches long, and provides a hoisting height of 32 feet in the retracted position. In this position the crane hook is 12 inches ahead of the front tires of the vehicle. In the extended position the crane can hoist 28 feet off the ground and 12 feet 4 inches ahead of the front wheels.

Capacity in the retracted position is 1,500 pounds; in the extended position, 1,000 pounds.

At the ground-level position the unit can reach 18 feet ahead of the wheels to pick up steel, lumber, scaffolding, and other stacked materials.

For further information write to the American Road Equipment Co., Dept. C&E, 4201 N. 26th St., Omaha, Nebr., or use the Request Card at page 18. Circle No. 64.

A Proved Way to Speed Output...
Bucyrus-Erie Dragline Buckets

Designed for Profitable Production A new-design Bucyrus-Erie dragline bucket helps deliver profitable production. The accurate balance of the bucket provides quick dig-in — so do properly pitched teeth, cutting edge and thin "slicing-action" lip. Tapered basket fills rapidly. Proper flare and balance reduce bobbing and spillage. High arch and smooth interior help bucket dump clean and fast.

For Long-Life Service

The use of BECOLOY cuts down the weight of buckets, yet makes them extra tough. BECOLOY has a fibrous structure which assures exceptional resistance to impact and shock. Field maintenance is simplified since the alloy can be cut with an acetylene torch and welded without special procedures.

A Size and Type for Every Job

New-design Bucyrus-Erie buckets are available in a wide range of sizes with solid or perforated baskets, in light, medium or heavy-duty types. Call your Bucyrus-Erie distributor for complete information on these buckets that outperform older designs.

27R57C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

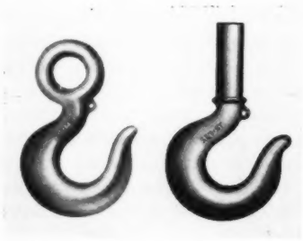
BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

For more facts, use Request Card at page 18 and circle No. 271

Drop-forged hooks feature capacities to 150 tons

A new line of load-rated hooks with capacities from ¾ ton through 150 tons are available from the Crosby-Laughlin Division of the American Hoist & Derrick Co.

These new drop-forged heat-treated steel hooks are said to provide adequate static strength, and to take heavy impact loads even at temperatures of zero or below. In addition, they are "fatigue"-resistant—notching caused by sharp loading devices or hairline cracks in the metal surface cannot develop and weaken the hook even with continuous operation —nor will these hooks crystallize and break, according to the manufacturer.



Every hook in the line has a drilled cam as an integral part. At any time during the life of the hook, a standard safety kit, consisting of latch, spring, and pin, can be added to the hook, to make it a safety hook. This cam in no way interferes with normal hook use.

For further information write to the Crosby-Laughlin Division, American Hoist & Derrick Co., Dept. C&E, P. O. Box 570, Fort Wayne, Ind., or use the Request Card at page 18. Circle No. 95.

an unbeatable two-some!

BMCO'S ROCKBUSTER

Reduces over size boulders to uniform specification material for the base course right where it's needed, with one pass, one operation. Eliminates grizzlies and clean-up costs. The ROCKBUSTER can be towed by any tractor or grader that will bridge the windrow. It's perfect for reconditioning scarified asphalt to material. Eliminates extra hauling and labor on clean-up... blends crushed rock with finest natural binder... single design keeps maintenance down — time at a minimum... no gears to strip... does not beat rock into the ground.

BMCO'S SELF-PROPELLED ROLLER

All wheels act independently in this exclusive design. It is impossible to overload any one tire... more weight is obtained because of the exclusive BMCO oscillation on all wheels... more uniform compaction is attained more quickly than with any other roller. Patented steering system gives gradual positive turning action that's fast enough to make a quick short turn. Large hydraulic service brakes apply on all drive wheels... can be locked that way for parking.

BMCO

BROWNING MANUFACTURING CO.

111 Humble Avenue San Antonio 6, Texas P. O. Box 2707

OTHER QUALITY ITEMS IN THE BMCO LINE:

PNEUMATIC ROLLERS · 50 TON COMPACTORS · SHEEPSFOOT ROLLER · VIBRATING ROLLERS

SEE THIS LINE AT YOUR NEAREST DEALER:

For more facts, use Request Card at page 18 and circle No. 272

Big cable dump trailer is completely redesigned

Tested with payloads up to 69,000 pounds, a new and completely redesigned cable dump trailer is announced by Hobbs Trailers.

On this new Hobbs-Schonrock model, according to the manufacturer, the sub-frame and riser brackets have been given new strength and allow more flexibility in the center beams so that shock loads are better absorbed. Rubber padding has been added where the center beams rest on

More strength in the entire unit, less strain during the dumping cycle with a new booster fifth-wheel design are claimed for the new Hobbs-Schonrock cable dump trailer. The unit is available both in single and tandem models.

the booster fifth-wheel lift arm. Jars, jolts, and vibration of metal-to-metal contact when truck and trailer are in motion are reportedly eliminated.

The booster fifth wheel now has a longer booster arm and enlarged roller to relieve the cable, frame, and truck from much of the pressure of the lift.

The tail-gate section, with off-set hinges at the top, makes higher stockpiling possible, and swings quickly when the trailer is dumping. (When the tandem is set closer than 42 inches, a protective skirt is added to the tail section to keep the load spilling free of axle, brakes, and tires.)

According to the manufacturer, the added construction features and design improvements have not increased the weight of the unit.

The Hobbs-Schonrock cable dump trailer is available in single and tandem-axle models. Length of the single-axle model is 15 feet 9⅝ inches. The standard tandems are available in 20 to 32-foot lengths.

For further information write to Hobbs Trailers, Dept. C&E, 609–33 N. Main St., Fort Worth 1, Texas, or use the Request Card at page 18. Circle No. 62.

Coil items added to forming accessory line

A complete line of coil ties, miscellaneous coil items, and coil hangers for use in concrete formwork is available from The Dayton Sure-Grip & Shore Co.

When coil ties are used, according to the manufacturer, fewer ties are required, extra-large panels can be used, and faster pours made.

According to the manufacturer, Sure-Grip coil ties with standard or tight cones are available in two-strut and four-strut types and in ½, ¾, 1 and 1¼-inch sizes. Capacities range from 6,000 to 36,000 pounds. Working parts of the ties are interchangeable.

Coil hangers, for use in form erection for building slabs and fireproofing beams, are available with safe working loads of 3,000, 7,500, and 10,000 pounds per side.

For further information write to The Dayton Sure-Grip & Shore Co., Dept. C&E, Kercher St., Miamisburg, Ohio, or use the Request Card at page 18. Circle No. 28.

New tool for tamping bottoms of deep holes

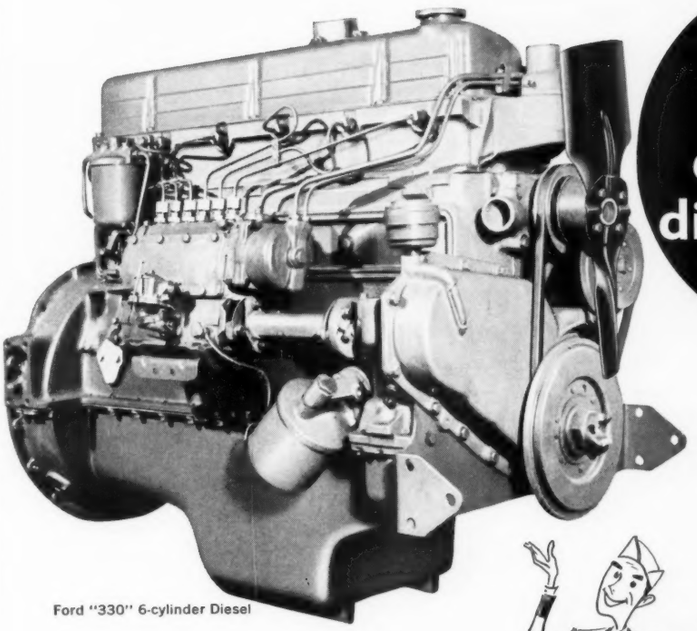
A new addition to the Worthington line of Blue Brute construction tools is a backfill tamper featuring an extra-long handle to facilitate tamping the bottoms of deep holes.

With an over-all length of 107½ inches, the tamper is said to be particularly suitable for preparing holes when setting utility poles. The crescent-shaped butt is designed to fit utility work and provides easy "walking".

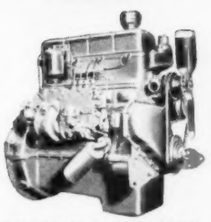
For further information write to Portable Compressor & Contractors' Tools Division, Worthington Corp., Dept. C&E, Holyoke, Mass., or use the card at page 18. Circle No. 39.

NOW,
Another modern diesel from FORD—

330 cubic inch displacement



Ford "330" 6-cylinder Diesel



Ford "220" 4-cylinder Diesel

Ford INDUSTRIAL ENGINES AND POWER UNITS

For dependable, heavy-duty service, you'll find the new Ford "330" Diesel hard to beat.

Clean and simple in design, the Ford Heavy Duty "330" is quality-built throughout for quick all-weather starting, dependable performance and top operating economy.

Included among its many advanced features are: removable "wet" cylinder sleeves that eliminate costly reboring; precision-made Four-Way Injectors giving higher combustion efficiency, greater economy; and rotating exhaust valves for better seating, longer life.

For power that's right for your particular application, choose either the new Ford Heavy Duty "330" Diesel or the Ford "220" Diesel.

ENGINE SPECIFICATIONS		"220"	"330"
Basic Model		X	Y
Number of Cylinders		Four	Six
Bore and Stroke—Inches		3.94 x 4.52	3.94 x 4.52
Displacement—Cubic Inches		220	330
Brake Horsepower	Dynamometer	61 @ 2250	96 @ 2250
	Continuous	49 @ 2250	77 @ 2250
Torque	Dynamometer	152#' @ 1600	236#' @ 1500
	Continuous	131#' @ 1600	189#' @ 1500
Compression Ratio		16 to 1	16 to 1

INDUSTRIAL ENGINE DEPARTMENT • FORD Division of FORD MOTOR COMPANY
P. O. Box 598, Dearborn, Michigan

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

For more facts, use Request Card at page 18 and circle No. 273

An improved design that reduces empty weight by 1,000 to 3,000 pounds per trailer is one of the features of the new Loadmaster line of dump trailers. The units are offered in capacities to 30 yards.

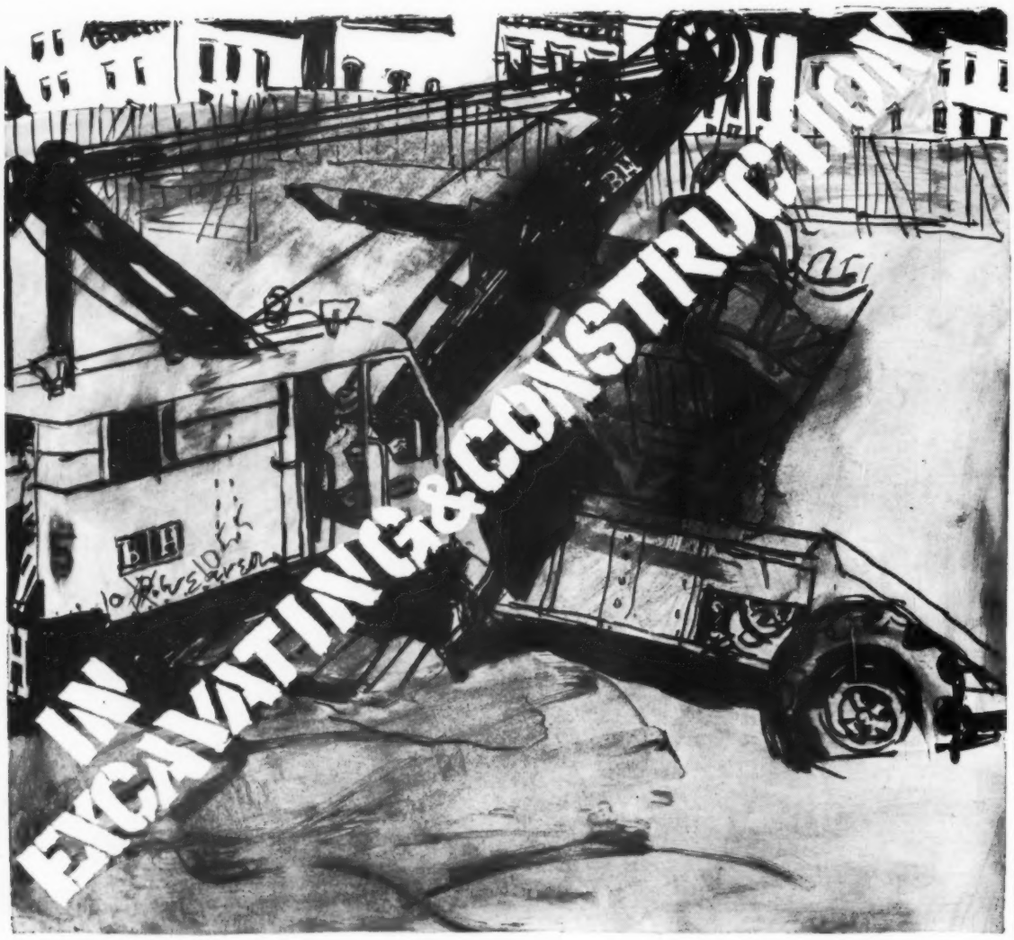
Design cuts empty weight of new dump trailers

A new line of dump trailers is announced by the Loadmaster Co. of Shreveport, La.

According to the manufacturer, the trailers incorporate innovations in design which permit reductions in empty weight of 1,000 to 3,000 pounds per trailer with correspondingly greater payload capacities. A new hydraulic cam action lift system permits extremely high dumping angles for handling sticky clays and other hard-to-dump materials. The dump angle is said to be as high as 80 degrees on some models, and 60 degrees on the longest dump beds.

These Loadmaster units are available in capacities from 10 to 30 cubic yards, with beds from 16 to 28 feet in length mounted on single and tandem axles.

For further information write to the Loadmaster Co., Dept. C&E, P. O. Box 4263, Shreveport, La., or use the Request Card at page 18. Circle No. 90.



NOTHING **TRANSMITS POWER** IN SO MANY **DIFFERENT** WAYS AS ROEBLING ROYAL BLUE WIRE ROPE. The uses to which Royal Blue is put in today's earth-moving and building construction equipment are extraordinary. The *reasons* why this wire rope enjoys its unique acceptance are equally outstanding: untiring flexibility, shock and abrasion resistance to a spartan degree, and high strength beyond the realm of common wire rope. Collectively, these characteristics give you a wire rope that provides longer service than any you have ever used . . . Royal Blue. For details of the most widely accepted rope in Roebling's history, contact your local distributor or write to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

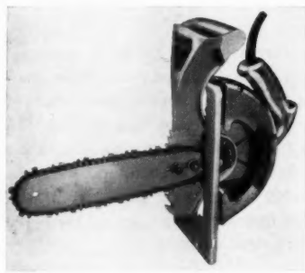
Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

ROEBLING
ROYAL·1105·BLUE
DESIGN
FOR WIRE ROPE
Its ready adaptability is evident wherever power is transmitted. It conforms to unique design requirements. Use wire rope to transmit power.

For more facts, use Request Card at page 18 and circle No. 274

Chain-saw attachment for portable electric saws

A chain-saw attachment for its Nos. 73 and 83 portable electric saws is announced by the Black & Decker Mfg. Co. Featuring safety and ease of handling, the attachment fits easily into either saw, forming an integral



unit for cutting timber, structural lumber, and stacked lumber, as well as for many other heavy cutting jobs.

Maximum safety is built into the attachment, the company reports, with a wide aluminum shield to fully protect the hand and other parts of the body. The Black & Decker saw itself has an instant-release trigger switch which gives the operator split-second on-off control.

The saw and attachment are said to form a perfectly balanced unit for ease of handling in hard-to-get-at places such as overhead beams and joints. The unit is also recommended for deep pocket cutting, for notching, and for other jobs where a regular circular saw is limited.

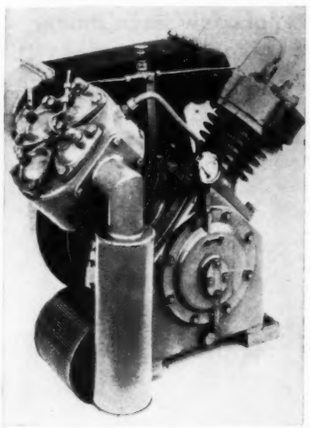
For further information write to the Black & Decker Mfg. Co., Dept. C&E, E. Pennsylvania Ave., Towson 4, Md., or use the Request Card at page 18. Circle No. 27.

Air-compressor series delivers 47 to 105 cfm

Atlas Copco announces a new series of continuous-duty air compressors delivering from 47 to 105 cfm at pressures of 100 psi.

Designated the NT series, the units range in weight from 440 to 595 pounds, and may be installed either as stationary or portable units.

All models in the series are air-cooled, two-stage, two-cylinder, single-acting machines. According to the



company, the units feature an automatic unloading principle that permits the cooling of cylinder interiors by fresh air, as well as reducing unit oil consumption.

The NT compressors reportedly are designed for direct-coupling to high-speed electric motors, as well as for V-belt drive from higher speed electric motors or diesel engines. They also are available in power-pack units.

Unit size ranges from 25×25×29 inches over-all for the NT-7, to 29×30×34 inches for the NT-9.

For further information write to Atlas Copco Eastern, Inc., Dept. C&E, 151 Linwood Ave., Paterson, N. J., or use the Request Card at page 18. Circle No. 52.

Pure polyethylene sheet has many applications

Richlite, a new pure polyethylene sheet said to have many construction uses, is available from The Richkraft Co.

Light in weight, easily handled, and moistureproof, when built into construction it reportedly will perform efficiently for the life of the structure. It will not become brittle, crack, or split, and is impervious to bacteria,

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.

rot, or mildew, the manufacturer reports. Paints, alkalies and caustics have no effect on it, and it is resistant to fire and most acids.

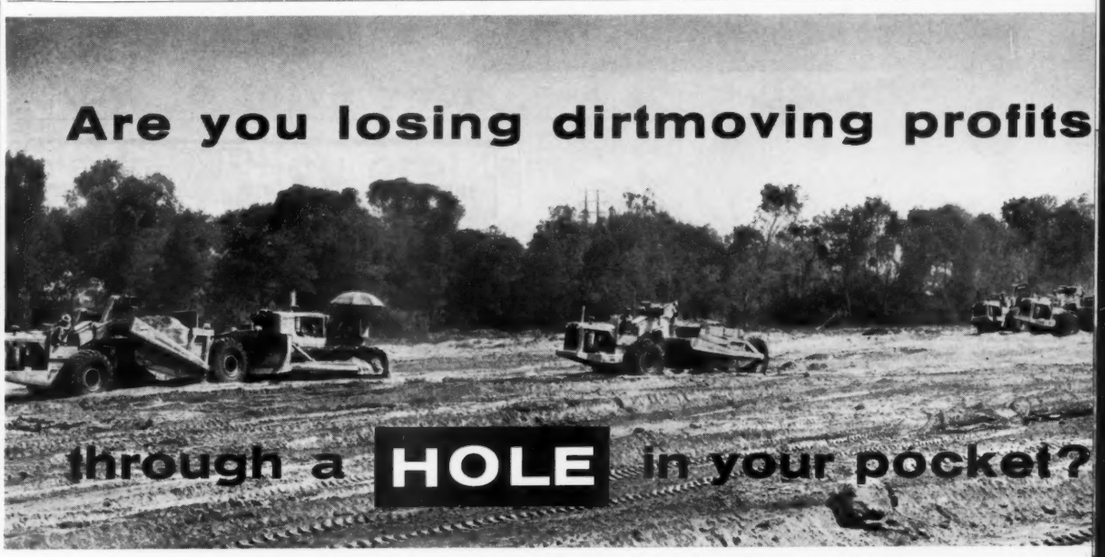
Richlite is said to be ideal as a water barrier, as well as for moisture and dustproofing over subflooring, under roofing, on the warm side of walls, around foundations, in crawl spaces, and under slab.

It can also serve as a waterproofing cover for equipment and material, and it meets all requirements for curing concrete, according to the manufacturer.

Richlite is offered in 2, 4, and 6-mil weights and in widths up to 40 feet—100 feet to the roll.

For further information write to The Richkraft Co., Dept. C&E, 510 N. Dearborn St., Chicago 10, Ill., or use the Request Card at page 18. Circle No. 25.

This sign span, made by Pfaff & Kendall for Florida's new Sunshine State Parkway, consists of tapered supports with truss-type span members made entirely of aluminum. According to the manufacturer, they will not rust, never need painting, and require no maintenance. The 45-foot span covers two full traffic lanes plus the service shoulders for each, and reportedly is capable of withstanding winds of hurricane force. The span itself is a standard P & K design, available in lengths to 100 feet. For further information write to **Pfaff & Kendall,** Dept. C&E, 84 Foundry St., Newark 5, N. J., or use the Request Card at page 18. Circle No. 29.



On every sizeable grading contract there are scattered small-yardage, odd-lot jobs . . . jobs that bleed away good profits made by your big-yardage machines on heavy production sections. These scattered small-yardage assignments — such as improving haul roads, opening drainage ditches, building shoulders, backfilling, leveling sub-grades, hauling and spreading topsoil — can easily delay your work completion, postpone final payments . . . reduce your profits.

You can plug this "hole in your pocket" with a high-speed, 1-man, 29.5 mph LeTourneau-Westinghouse D Tournapull® with 9-yd. scraper. This "Handyman D" travels anywhere — via highways, over curbs or tracks, across fields — often gets to a job and finishes it before less versatile equipment can be loaded on a flat-bed for transport.

180° turns in 24'3" radius

Fingertip electric kingpin power-steer, continuous 180° turns within 24'3", excellent visibility — all these advantages enable "D" to work in tight quarters and around obstructions that seriously slow down production of other types of equipment.

The "D" loads itself. Or two "D's", equipped with dozer blades, working together, can push-load each other. Unit spreads evenly to any required lift . . . does excellent scraper finishing jobs.

Equipped with 8-ft. dozer blade, "D" clears land, backfills, removes snow, and does other miscellaneous dozing jobs, which add to its value as a versatile small-yardage tool.

When your odd-job schedule is completed, you can put the 9-yd. D Tournapull in with a production fleet, and profitably pusher-load it to heaped capacity.

Interchangeable equipment

Versatile D 'Pull* prime-mover can interchange from scraper to operate rear-dump, side-dump, flat-bed, crane, logging arch, or transit mixer. Any of these extra LeTourneau-Westinghouse trailing units can be purchased at about ¼ the price of the original Tournapull scraper.

*Trademark DP-1096-DC-1

Ask for an on-the-job demonstration. See for yourself how you can "plug that hole in your pocket" with fast, "handyman" D Tournapulls. Call or write for complete information. No obligation.

D 'Pull safely handles clean-up on slab. Big, low-pressure tires distribute machine weight, roll over new pavement without damage.

Finish grading median-strips is just one of many odd jobs profitably handled by D Tournapull. Only 8' wide and within 9-ton axle-load limit, do-it-all "D" travels over highways without special permit.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

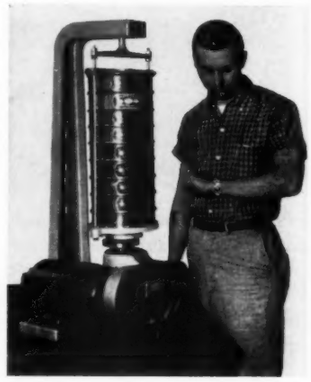
Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 275

The improvements in design reported for this new Little Giant Model 32 10½-ton truck-mounted crane include relocated controls, special hydraulic track shoe adjustment, and cut teeth on swing pinions and bull gears. Increased efficiency and decreased operator fatigue are said to be the result. Two other new models, rated at 7 and 15-ton capacities, are also available. For further information write to **Little Giant Crane & Shovel, Inc.**, Dept. C&E, E. 16th and Howard Drive, Des Moines, Iowa, or use the Request Card at page 18. Circle No. 79.

Report new sieve shaker ideal for all operations

A new pattern in shaking action reportedly has been built into the new sieve shaker available from Soiltest, Inc. According to the manufacturer, the new unit gives the same accurate and complete sieving to all types of



materials that were formerly separated on larger, heavier shakers.

The Soiltest unit can be used for all types of field, laboratory, and production sieving or grading operations on materials such as soils, sand, gravel, aggregates, and similar granular or powdery substances.

The new shaking pattern involves the sieve platform being rotated in a small circular arc at the same time it is being swayed in a vertical arc. An impact is imparted to the platform six times per revolution. The shaker motion continuously moves and redistributes the particles being analyzed over the sieve meshes. The tapping action is said to assure proper separation of all materials and a fast flow of the materials through the sieve meshes.

The sieve shaker is available in either hand-operated or motorized models, and in sizes for 12-inch, 8-inch, and smaller-diameter sieves.

For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 23.

Portable air compressor is easily maintained

The Gardner-Denver Co. announces the addition of the Model RP210 to its line of rotary portable air compressors. The company now has a line of five sizes: 125, 210, 365, 600, and 900 cfm.

As in previous models, a clutch between the engine and the compressor is a feature.

In cold weather, the company reports, with the clutch disengaged the engine starts freely, and warm engine water circulates through the compressor oil cooler and reservoir. Thus, warm, free-flowing oil is supplied to the compressor as soon as it starts turning.

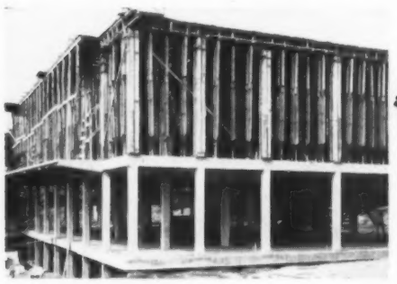
An oil pump assures positive oil flow for compressor lubrication and cooling, independent of receiver pressure, under all operating conditions. The water-oil cooling system report-

"No Added Costs"

with

Rooshors

The ONE-MAN SHORE



Some types of form supports require special equipment and more labor to install, adjust and remove. Costs climb and profits drop.

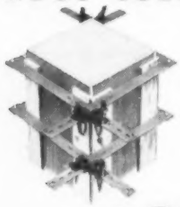
ROOSHORS ARE A ONE-MAN OPERATION

Rooshors require just one man to install, adjust and remove. There's no chance of support failure or tricky camber adjustments to make. Easy to transport, handle and store, contractors know Rooshors are more dependable and useful for all shoring requirements.

COMPARE THE COST AND VERSATILITY

Rooshors are used for interior and exterior beam shoring, heavy beams, fire walls, slab, high story shoring, wall bracing, buggy runs, etc. They're economical too, to rent or buy.

ROOS COLUMN CLAMPS



- Speed the clamping of columns.
- Automatically square the column forming.
- No parts to come loose or lose.

BAKER-ROOS, Inc.

P. O. BOX 892 • INDIANAPOLIS 6, INDIANA

Free Literature

Write for complete descriptive literature on Rooshors and Roos Column Clamps.

BAKER-ROOS, Inc. C&E
P. O. Box 892, Indianapolis 6, Indiana
Gentlemen: Send your literature on Rooshors and Roos Column Clamps without obligation.

Name:

Organization:

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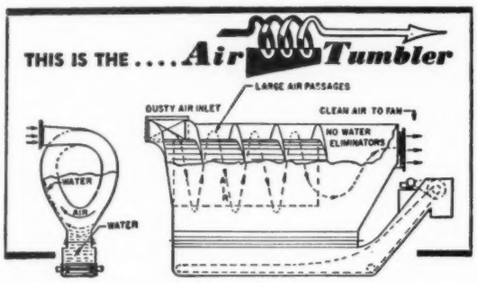
City: State:

For more facts, use coupon or circle No. 276

THIS IS THE .... Air Tumbler



the master of DUST *in industry* ★ ★ ★

SIMPLE — DEPENDABLE
NO FIRE HAZARD
HIGH EFFICIENCY
CONSTANT CAPACITY
LOW OPERATING COST

WRITE FOR BULLETIN NO. 531

DUST SUPPRESSION & ENGINEERING COMPANY

P. O. BOX 67 • LAKE ORION, MICHIGAN

For more facts, circle No. 277

BUY NOW AT TREMENDOUS SAVINGS!

GMC 6x6

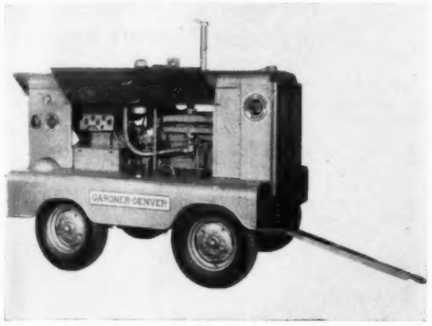
UNUSED! FACTORY-NEW PERFORMANCE!

Save up to $3,000 on an unused Army 6x6 . . . *guaranteed* new-truck performance. **Rugged Front-Wheel Drive** . . . gives *extra* power when the going gets tough! **Tandem Rear Axle** . . . carries heaviest loads over roughest terrain on "off-road" jobs. **Delivered On Approval!**

For Specifications, prices, delivery write, wire or phone collect: JAckson 5-7841 MILTON Y. TOOMBS, JR., Sales Manager.

MEMPHIS EQUIPMENT Company
ARMY TRUCKS • PARTS
CONSTRUCTION EQUIPMENT
766 SO. THIRD STREET • MEMPHIS, TENNESSEE

For more facts, circle No. 278



This Gardner-Denver Model RP210 rotary portable air compressor increases the company's line to five sizes: 125, 210, 365, 600, and 900 cfm. Simplicity of maintenance is one of the unit's important features.

edly maintains constant operating temperature for both compressor and engine, even during extremely hot or cold weather.

The RP210, powered by either a gasoline or diesel engine, is available on two or four-wheel mountings, or on wood skids. The two-wheel unit is 12 feet long with drawbar, 67¼ inches wide, 6 feet 3 inches high, and, with gasoline engine, weighs 5,240 pounds. The four-wheel model is 102 inches long, 65¼ inches wide, and 6 feet 2 inches high.

For further information write to the Gardner-Denver Co., Dept. C&E, S. Front St., Quincy, Ill., or use the Request Card at page 18. Circle No. 37.

Add new design features to heavy-duty dump body

New design features incorporated into the Gar Wood-St. Paul Model GC-2 heavy-duty dump body are announced by Gar Wood Industries, Inc.

The unit now includes box-type side braces for greater support for the side panels. New vertical and horizontal

bracing for the tail gate protects it from distortion, even under the roughest usage, the company reports.

Additional strength for the body is provided by continuous welding around all side braces and the tail gate. A new wrap-around angle brace strengthens the body's corner post and entire rear end, and prevents bending of the floor at the rear edge.

To make dumping easier, the body's tail-gate hinge point is two inches higher than the top edge of the tail gate. According to the manufacturer, this prevents the load from exerting a counter force on top of the tail gate, allowing it to swing free without bending or breaking.

For further information write to Gar Wood Industries, Inc., Dept. C&E, 36253 Michigan Ave., Wayne, Mich., or use the Request Card at page 18. Circle No. 53.

Offer water-reducing agent for concrete

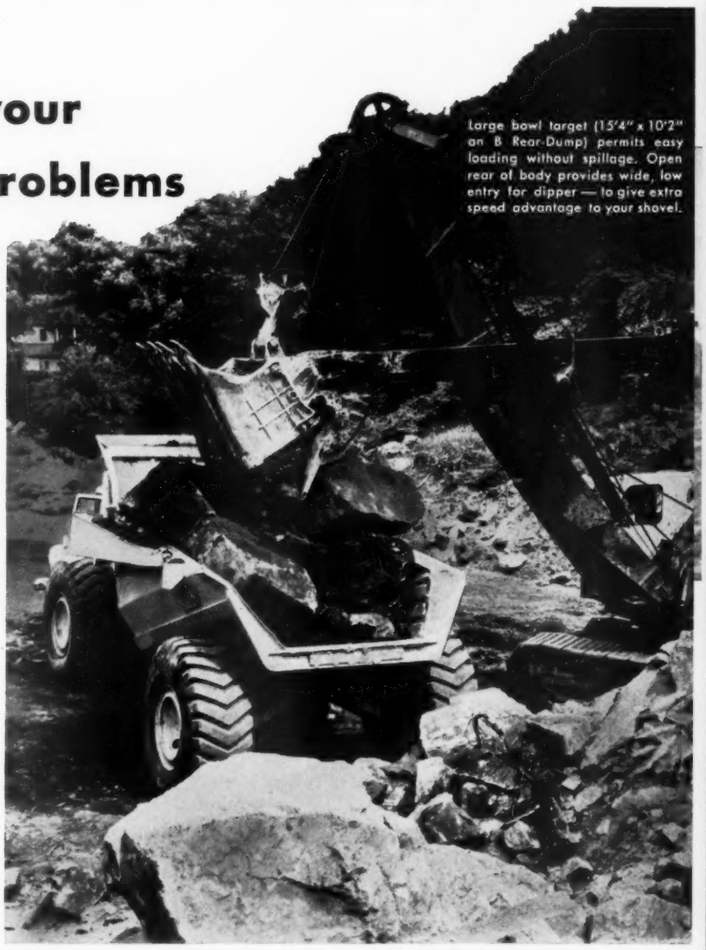
A new concrete admixture said to provide maximum water reduction, better cement dispersion, and selective initial retardation in all types of mixes is offered by the Autolene Lubricants Co. Extended placing and vibration time with PDA is said to make possible the placing of even "hot" cements with negligible plastic placement shrinkage.

According to the company, PDA provides a live concrete free from segregation and hot-weather slump loss even after long-hauls, as well as greater strength at any age, increased durability, and reduced bleeding.

PDA is packaged in 50-pound bags.

For further information write to the Autolene Lubricants Co., Dept. C&E, 1331 W. Evans Ave., Denver, Colo., or use the Request Card at page 18. Circle No. 68.

How to solve your rock-hauling problems at low cost



Large bowl target (15'4" x 10'2" on 8 Rear-Dump) permits easy loading without spillage. Open rear of body provides wide, low entry for dipper — to give extra speed advantage to your shovel.

With today's highway specs calling for *straight, level* right-of-ways, earthmoving contractors are often faced with the problem of removing large rock formations. With LeTourneau-Westinghouse Tournapull® Rear-Dumps, you can maintain job efficiency and still keep equipment inventory at a minimum.

These high-production L-W haulers offer plenty of power, traction and maneuverability for toughest off-road earthmoving. What's more, you have the economy advantage of being able to interchange scraper, flat-bed, crane, etc., for Rear-Dump unit — behind same prime-mover.

Check the following Tournapull Rear-Dump features. They can help solve your rock-hauling problems . . . and increase profits!

Hauls anywhere — Big single, *load-rated* tires let Rear-Dumps easily haul cross-country — over roughest terrain, through muck and soft fills. Unit also travels job-to-job under its own power, over paved highways or city streets. Tires do not damage paving, RR tracks, etc.

Speeds loading — Wide bowl, with low rear entry, makes loading easier, faster. Permits quick bucket swing-out, while dipper-door is still open. And because of large target area, spillage is greatly reduced. Production delay for clean-up around shovel is minimized.

Front-wheel drive Tournapull hauler dumps load clean over bank edge, eliminating dozer clean-up. Pulls out with front wheels on solid footing. Can also "hump" out of soft footing without wheel spin — by dump action plus alternate braking of front and rear wheels.

Dumps fast, clean — Just the flick of dashboard switch instantly activates point-of-action electric hoist motor. Body raises quickly to desired angle. At full dump position, edge of bowl is low behind rear wheels . . . so material cannot roll forward to lodge against wheels, nor pile under rear end. Smooth body sheds stickiest material readily.

Resists body shock, damage — Slanting walls of all-steel body, plus heavy 3-layer bottom, beat shock-load problems. Heaviest materials deflect off sloping sides . . . quickly build up a shock-cushion in bottom. Reinforced bowl floor on C Rear-Dump — for example — consists of 1½" steel billets, between ½" steel bottom and a ¾" steel plate facing.

Short 180° turns — Rear-Dump makes continuous 180° turn in space less than hauler's own length. In dump position, it turns in only about ⅔ of overall length! This unusual maneuverability of L-W Rear-Dumps allows you to work in tight quarters where smaller conventional haulers often cannot go.

For complete information

Why not see how you, too, can increase production, lower hauling costs with L-W Tournapull Rear-Dumps? Call or write for complete information on price, delivery, and the bonus interchangeability features. 3 sizes: 11, 22 or 35 tons.

R-1448-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For More facts, use Request Card at page 18 and circle No. 279

How to "jump" a derrick—raise it from floor to floor on a building construction project without using other lifting equipment—is the subject of a pamphlet available from the American Hoist & Derrick Co. Detailed drawings supplement the step-by-step description of the process, which is presented under three basic headings: separating boom and mast, raising the mast to the new level, and raising the boom to the new level. The system is said to have proved effective over a period of years on many different jobs. For further information write to the **American Hoist & Derrick Co.**, Dept. C&E, 63 S. Robert St., St. Paul 7, Minn., or use the Request Card at page 18. Circle No. 55.

Portable cement plant needs no separate hopper

A new type of bulk cement plant that can be towed at normal road speed by a standard truck-tractor is announced by Ross & Son.

The unit has a 220-barrel capacity, and is adapted to any situation where bulk cement may be desired, according to the manufacturer.

The new Ross portable bulk cement plant is shown in the operating position. This highly portable plant reportedly can be made ready to produce within minutes after arriving at the job site.

Featured in the design is a cement hopper that falls into place when the unit is raised into operating position. Power is supplied by a 30-hp gasoline engine to a 9-inch screw system capable of loading and elevating 150 barrels per hour. The loading hopper has a 10-foot extension to accommodate dump trucks, tail-end, hopper-bottom dump trailers, or rail-loading operations.

The unit has a traveling length of 31 feet 6 inches, a width of 7 feet, and is 12 feet 4 inches high. The silo dimensions are 25 feet high, 7 feet wide, and 7 feet long. The unit weighs 13,500 pounds empty.

For further information write to Ross & Son, Dept. C&E, Box 446, Brownwood, Texas, or use the Request Card at page 18. Circle No. 70.

Adapt off-highway trailer for over-the-road travel

The adaptation of its standard off-highway drop-door side-dump trailer to meet state highway regulations while still hauling maximum payload is announced by the Easton Car & Construction Co.

Originally designed for a cement producer to haul blasted rock from a new source to the established plant, the new Easton Model TD-1115 trailer is constructed of special alloy steels, and a tandem trailer suspension has been added.

According to the manufacturer, the trailer body's fully automatic door is essentially the same as on Easton mine and quarry drop-door truck bodies and trailers. As the body is raised or lowered, the door is opened or closed, automatically. When in

There's versatility and extra performance in NAYLOR pipe lines—to meet all your requirements.

For dredging operations. For tunnel ventilation. For de-watering and drainage. For hydraulic sluicing. For air to operate pneumatic tools. For water lines. For materials handling.

Light in weight, but extra strong and safe in service, NAYLOR Spiralweld pipe is easy to handle and install. Lines can be made up faster, too—especially when you use the one-piece NAYLOR Wedgelock coupling to speed connections.

It's this all-around dependable and economical performance that has made NAYLOR the stand-by for contractors.

For complete details, write for Bulletin 507.

NAYLOR

NAYLOR PIPE COMPANY

1270 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office 60 East 42nd Street, New York 17, N. Y.

For more facts, use Request Card at page 18 and circle No. 280

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This Easton Model TD-1115 drop-door side-dump trailer has been adapted from the standard off-highway unit to meet state highway regulations while still hauling maximum payload. The trailer is mounted to a six-wheel Autocar Model DC-7564 chassis with tandem drive.

dumping position the door is flush with the floor of the body and provides a chute for the discharging load.

Dumping is accomplished by means of a standard push-button-controlled automatic electric overhead dumping system located at the crusher hopper.

The trailer is mounted to a six-wheel Autocar Model DC-7564 chassis with tandem drive.

For further information write to the Easton Car & Construction Co., Dept. C&E, Easton, Pa., or use the Request Card at page 18. Circle No. 30.

New type cutting edge for earthmoving units

A new type cutting edge for earthmoving and road-maintenance equipment is announced by the Shunk Mfg. Co.

Designated 'Gator Twistooth blade, the cutting edge features teeth on the

cutting surface that enter the earth or road surface at different angles. Because of this, and the chisel-shaped design of the teeth, only a minimum of blade area is said to be required for initial contact with unbroken surfaces.

Another reported advantage of the blade is that it crumbles material to the point where it improves the spread pattern and permits faster and more even discharge. This is said to leave the material in much better condition for compaction, and results in fewer passes by the compaction equipment.

The new blade is available with accurately punched holes for quick and easy on-the-job installation for all makes and models of dozer and grader moldboards, front-end loader buckets, and scrapers.

For further information write to the Shunk Mfg. Co., Dept. C&E, Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 40.

Offer new power speaker for 2-way mobile radios

A transistorized Big Voice power speaker said to extend the listening range of two-way mobile radios by hundreds to thousands of feet is announced by Motorola, Inc.

In addition, the turning of a simple control converts the speaker into a powerful public address system with a half-mile or more range.

With five transistors in the speaker and control unit pre-amplifier, the new speaker reportedly provides up to 15 watts power output at 12 volts, and 5 watts at 6 volts while holding the vehicle battery drain to a minimum.

The unit readily connects directly into current Motorola two-way radio units, and is easily adapted to other makes and models.

For further information write to Motorola, Inc., Communications and Industrial Electronics Division, Dept. C&E, 4501 W. Augusta Blvd., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 134.

Good job-planning pays off!

With 150 hp Adams 660 pushing, D Tournapulls get payloads fast. Matched speed of machines resulted in faster cycles . . . helped contractor complete job ahead of schedule.

How Michigan contractor teams 2 'Pulls with 150 hp Adams grader to save time and materials

H. H. Shinville of Kalamazoo, Michigan, has found his fleet of LeTourneau-Westinghouse earthmovers real money-makers. Contractor Shinville owns two D Tournapulls, and four heavy-duty Adams graders — two "550's", a "660" and a "512".

Leveling a section of a local road for resurfacing — near Portage Center, a suburb of Kalamazoo — contractor teamed his two 7-yd. "D's" with the "660". With this combination of units, he was able to reuse much of the existing road surface as sub-base for new grade — resulting in a substantial saving in both time and materials. Here's how Shinville's crew handled the project.

1. Blacktop scarified, pulverized — With the scarifier, the "660" ripped asphalt road surface. In same pass, grader pulverized ripped material by pulling a 15-ton grid roller. Unit scarified and pulverized 750 cu. yds. of blacktop per hour.

2. Material stockpiled — Tournapulls loaded pulverized asphalt from low spots, and stockpiled it for later reuse. Pushed by dozer equipped "660", "D's" averaged 6-yd. loads in 70′.

3. Bring low areas to grade — D 'Pulls then loaded from nearby borrow pits and from high spots on road, to fill low areas to grade.

4. Reclaim asphalt as sub-base — Finally, stockpiled asphalt was reloaded, hauled, and spread by D Tournapulls on new grade. By reusing pulverized asphalt over fill, contractor gained 3″ of specified 6″ sub-base. The "660" then finished off the job — preparing grade for blacktopping, sloping banks, and cutting ditches.

Remove trees — works during winter months

Shinville's Adams 660 grader also pulled over trees, and picked up rooted-out stumps with the edge of its grader blade . . . depositing them in trucks for removal. During winter months, grader plows snow for city of Galesburg, and for private parking lots and industrial sites.

Foreman Harry V. Peckens commented, "Our '660' handles a lot of jobs that you shouldn't ask a grader to do. This rugged grader takes a beating, and it hasn't hurt it at all."

Get complete facts

Why not get complete details on LeTourneau-Westinghouse earthmovers? New improved "D's" give even more yards per hour than those described here. They have 9-yd. heaped capacity, make 180° turn in area only 24′3″ wide . . . within 8′ width, and 9-ton axle load limit, they road without special permit.

Besides "660" shown, Contractor Shinville also owns two 123 hp Adams 550 graders and an older Model 512. Here "550" grades parking lot for Western Michigan College. Operator Erskane Banghart says, "I like the rugged dependability of the '550', and the fact that I can swing the blade under a load. That power-shift moldboard is worth a million dollars."

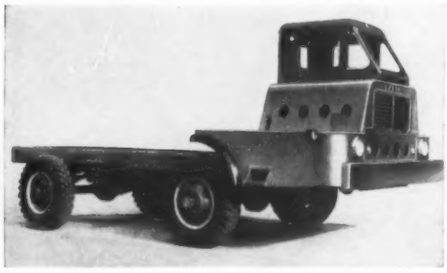
Adams—Trademark; Tournapull—Trademark Reg. U.S. Pat. Off. AGDP-1371-DC-I

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 281



Features of the Model FAB 100 off-highway service truck include equal power and equal load for all wheels, and a 111-inch wheelbase for a 14-foot body. The unit is also said to have a substantially decreased turning radius.

Curb and gutter paving forms made of a strong magnesium alloy called Magnalite are shown on Chicago's Calumet Skyway. According to the manufacturer, these forms are easy to handle, place, and transport. Measuring 1 foot wide and 10 feet long, each unit weighs only 47 pounds. Forms 12 feet in length are also available. For further information about Magnalite forms, write to **Dotmar Industries, Inc.**, Dept. C&E, 502 Hanselman Bldg., Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 120.

Announce service truck for off-highway use

A new off-highway 4×4 service truck is announced by the F.A.B. Mfg. Co.

Designated Model FAB 100, the unit reportedly features equal power and equal load for all wheels; 80-inch track and 61⅝-inch spring centers; 111-inch wheelbase for a 14-foot body; and a 50 per cent tighter turning radius.

Other features include a forward tilt hood for engine accessibility, as well as a unique front spring suspension in connection with the front driving axle, said to transmit full engine torque and provide greater load capacity.

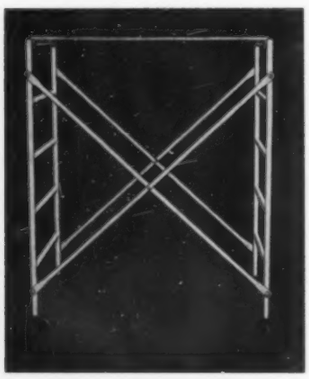
For further information write to the F.A.B. Mfg. Co., Dept. C&E, 1249 67th St., Oakland, Calif., or use the Request Card at page 18. Circle No. 50.

Folding scaffold unit designed for light duty

An all-steel light-duty scaffold unit that folds compactly for moving or storage is offered by Bil-Jax, Inc.

Designated Handyman, the unit is 6 feet high (plus caster height), and the plywood platform is 5 feet long. Over-all width is 28 inches.

According to the manufacturer, one man can easily set it up in a few

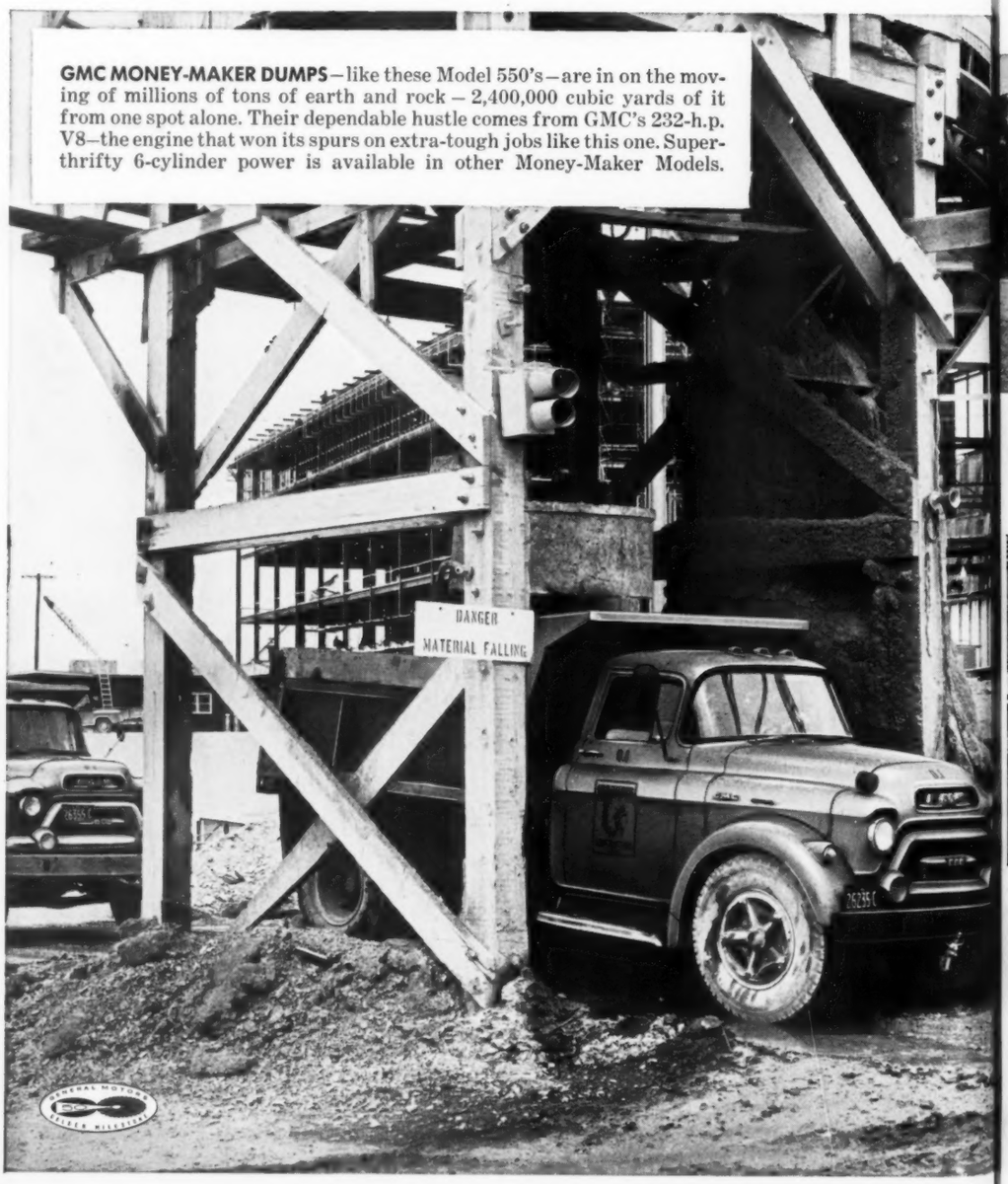


minutes, and by removing the braces from one ladder section, the entire unit folds neatly for hauling atop any light-duty vehicle. The platform can be removed from the top rung and placed on any rung desired.

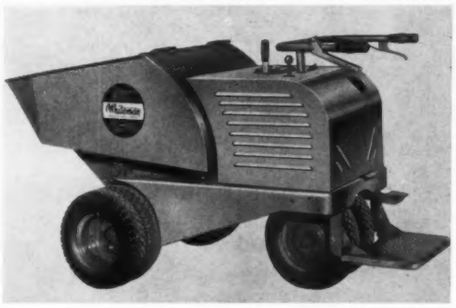
For further information write to Bil-Jax, Inc., Dept. C&E, P. O. Box 38, Archbold, Ohio, or use the Request Card at page 18. Circle No. 75.

With millions of tons to move fast—

St. Lawrence Seaway



GMC MONEY-MAKER DUMPS—like these Model 550's—are in on the moving of millions of tons of earth and rock—2,400,000 cubic yards of it from one spot alone. Their dependable hustle comes from GMC's 232-h.p. V8—the engine that won its spurs on extra-tough jobs like this one. Super-thrifty 6-cylinder power is available in other Money-Maker Models.



A fold-down platform which allows the operator either to walk behind or ride on the unit is a main feature of the new Walk-or-Ride Power Buggy. The machine has a capacity of 10 cubic feet of concrete. ►

Operator may ride on, walk behind new concrete buggy

A new model of its concrete Power Buggy, which allows the operator either to walk behind or ride on a fold-down platform, is available from the Whiteman Mfg. Co.

Designated Walk-or-Ride Power Buggy, the unit is said to be compact, lightweight, and extremely maneuverable. It is designed to travel over narrow, light runways, onto elevators, and through doorways as narrow as 31 inches.

The new unit features a 10-cubic-foot capacity. It also features a positive-control dumping mechanism that permits placing the concrete neatly and accurately, according to the manufacturer. Powered by a Wisconsin engine, it has front-wheel chain drive, automatic clutch, and forward and reverse drive. Speeds up to 5 mph are offered.

This Power Buggy is also available with a flat-bed body.

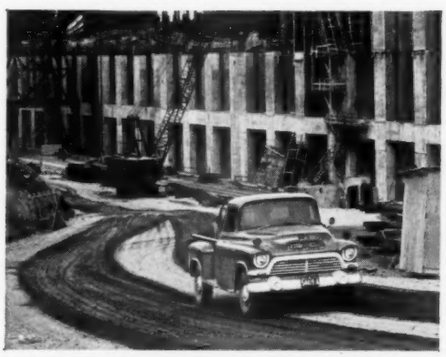
For further information write to the Whiteman Mfg. Co., Dept. C&E, 13020 Pierce St., Pacoima, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 65.

apuilders called for GMC's!

GMC Money-Makers available in models from ½ to 45 tons

BRAWNY GMC MONEY-MAKER TANDEMS—like this big Model W660—are holding down some of the toughest assignments on the Seaway project. Extra-stamina engineering—including full-length frame reinforcements installed at the factory—let users haul thousands of tons of steel—day after day—without strain. GMC Money-Maker Tandems blanket the 28,000 GVW-90,000 GCW field.

GMC's 2-CYCLE DIESEL POWER PAYS OFF—again and again—when you're hauling big loads up steep, underground passageways. Secret is the massive torque output that gives you pulling power to spare—even with a king-size load. And GM Diesel engines—dramatically improved in the newest GMC models—are already setting new efficiency and economy records for truck-users everywhere.



CONTRACTORS CHOOSE GMC PICKUPS for their on-the-job transportation and equipment-servicing work for just one reason: GMC light-duty Money-Makers are "built like the big ones"—with extra-stamina, extra-performance features that pay off in longest truck life—at lowest cost of all.

GMC TRUCK & COACH—*A General Motors Division*

GMC—America's Ablest Trucks

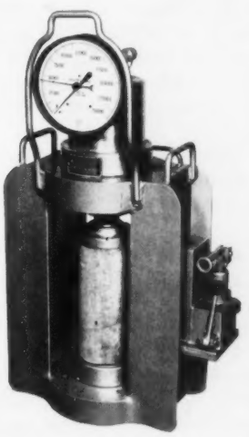
For more facts, use Request Card at page 18 and circle No. 282

Concrete-testing machine is portable, accurate

A high-capacity portable testing machine, said to make possible rapid on-the-job testing of concrete and similar materials with laboratory accuracy, is available from Soiltest, Inc.

The 250,000-pound-capacity unit can be used in field, plant, or laboratory testing of concrete cylinders and beams and other construction materials. The tester is entirely self-contained, and no electrical or pressure connectors are required.

According to the manufacturer, the portable testing machine is simple to operate. Loads are developed by

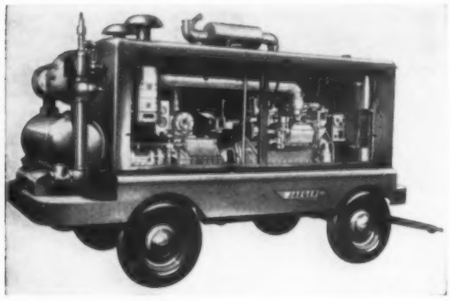


means of a hand-operated, two-speed concentric pump which actuates the piston of the main hydraulic system. The unit reportedly meets ASTM and AASHO specifications for design and accuracy of hydraulic concrete-testing machines.

Equipped with a large direct-reading gage and a maximum load pointer, the machine is said to be accurate to within one per cent of the indicated load.

Standard 6-inch-diameter concrete cylinders 12 inches high are accommodated in the normal machine setup. Variations in specimen height are easily compensated for by adjusting the upper platen.

For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 127.



The latest Jaeger Model 600 rotary compressor is powered by the same GM diesel engine featured in previous models, but operates at slower speeds. The machine reportedly averages an output of 600 cubic feet of 100 psi air per 1.2 pounds of fuel.

New compressor features 1,650-rpm full-load speed

The complete standard equipment of the latest Jaeger Model 600 rotary compressor includes a two-pass exhaust muffler, automatic blowdown valve, swing-type check valve, copper tube finned multipass air cooler, adjustable radiator shutters, wrap-around bumpers, automotive steering axle, and a lifting bail.

The new Jaeger uses the same model GM 6-71 diesel engine as all other 600 compressors, but operates at slower speeds; its full-load speed is only 1,650 rpm instead of the usual 1,800 rpm. According to the manufacturer, the machine averages an output of 600 cubic feet of 100 psi air per 1.2 pounds of fuel.

Simple, fast-acting, close-regulated controls reportedly hold pressure constant under fluctuating demands.

For further information write to The Jaeger Machine Co., Dept. C&E, 550 W. Spring St., Columbus 16, Ohio, or use the Request Card at page 18. Circle No. 36.

Tough bridging problems solved by prefab units

Specially designed Bailey bridges, said to be particularly suited to areas with access difficulties and where there is a shortage of skilled labor, are available from Contractors Service Ltd.

According to the manufacturer, all component parts are readily handled, and the bridges can be erected by unskilled labor without the assistance of a special site plant. The parts are gaged to ensure perfect interchangeability, and a special paint process gives protection against all normal atmospheric conditions.

The main girders of the Bailey bridges are formed by pinning panels together, end to end, with the roadway decking being carried between the main girders. The strength of these girders can be increased by the addition of extra panels both alongside and on top of the original panels.

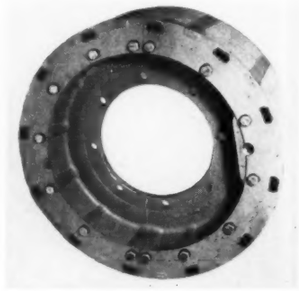
For further information write to Contractors Service Ltd., Bailey Bridge Dept., Dept. C&E, 38 Commercial Road, Toronto, Canada, or use the Request Card at page 18. Circle No. 5.

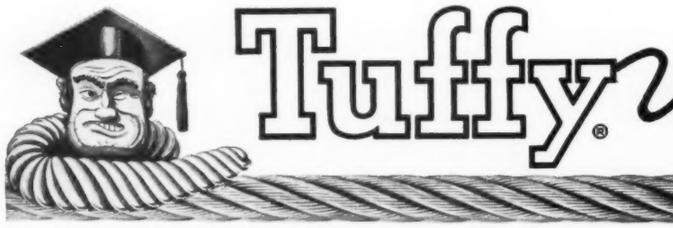
New full-circle brake for off-the-road units

A new heavy-duty, full-circle brake for off-the-road equipment is announced by B. F. Goodrich Aviation Products.

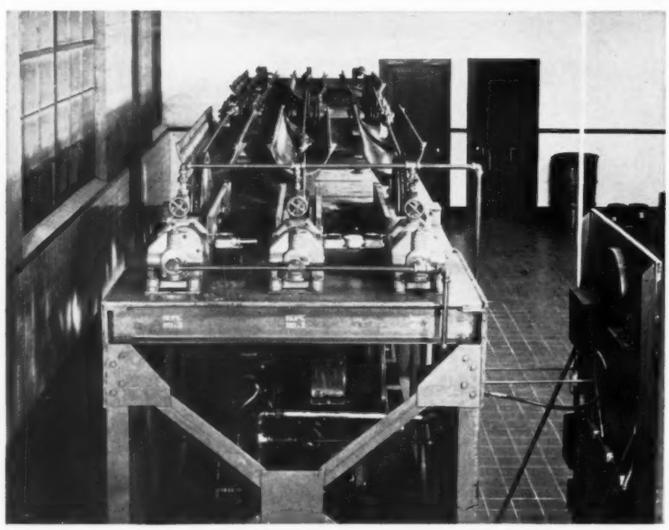
Designated Hi-Torque, the unit is a hydraulic drum-type brake with 360-degree expander tube actuation designed exclusively for large tractors, scrapers, and earthmovers.

According to the manufacturer, the new brake operates with nearly constant lining pressures at all points around the drum area, at only one-half the usual maximum lining pressure encountered with anchored shoe brakes. Built-in automatic adjustment assures constant braking efficiency throughout the life of the lining. Extremely low maintenance and slow lining wear, as well as greater safety and control while operating at





Tuffy® Wire Rop



How Union Wire Rope Fatigue Tester Scientifically Predetermines Rope Life

How much service life can you expect from a given wire rope construction? Until recently there was very little factual data to answer that question. Predicting how long a certain wire rope would last under a given set of operating conditions was largely a matter of guesswork, trial-and-error and generally inexact calculations.

Knowing that bending stresses are a major factor in wire rope life, Union Wire Rope engineers designed the Accelerated Fatigue Tester, shown above, to pin down the effects of bending. Now, from a long series of bending tests, scientific data has been accumulated and organized to take the place of former rule-of-thumb methods.

"Preview" of Service Life You Can Expect

The data established by this laboratory research is based on the effects of various sheave diameters on bending stresses of various constructions of wire rope.

From test data, bending life curves have been plotted by Union Wire Rope Engineers for each of the more widely used rope constructions. Analysis of each of these curves showed them to follow a pattern expressed by the curve shown in Fig. 1 at right, above.

Note on Fig. 1 the curve shows that as the ratio of tread diameter to rope diameter increases (see D/d figures at bottom of chart) the longer the relative service life as expressed by the figures at the left of the chart.

However, there are few pieces of equipment on which sheave and drum sizes can be large enough to afford D/d ratios above 50. From test data the general-purpose range of D/d ratios was determined. Those recommended are set up in Table 3.

Spotted on the curve, for example, is the D/d ratio of 24 at point 2 and D/d ratio of 36 at point 1—these being the range for general purposes taken from Table 3 for the 6x25 filler rope. Moving from these points to the left on the chart, the relative service life of this rope ranges from 14 to 34 units of any service measure used, such as yards, tons, days, etc.

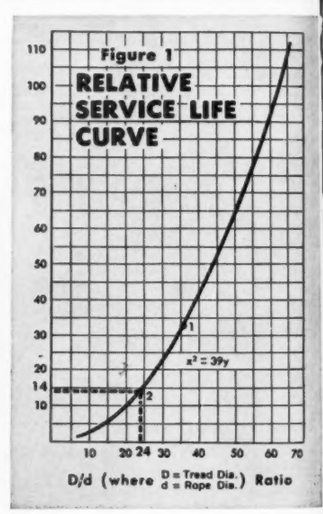


Table 2

BENDING-LIFE FACTORS
When Using Curve of 6x25 FW

CONSTRUCTION	FACTOR
6x7	0.57
18x7	0.67
6x17 Seale	0.73
6x19 Seale	0.80
6x21 Filler Wire	0.92
6x25 Filler Wire	1.00
6x31	1.00
8x19 Seale	1.14
6x37	1.33
8x19 Warrington	1.33
Tiller Rope	2.00

Table 3

SHEAVE DIAMETER FACTORS

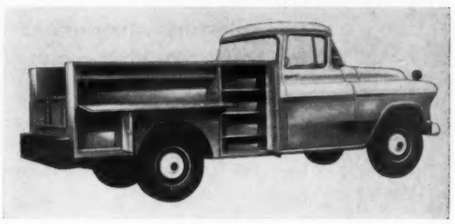
ROPE CONSTRUCTION	GENERAL PURPOSE RANGE D/d Ratios (Where D = Tread Dia. d = Rope Dia.)	
6x7	63	42
18x7	54	36
6x17 Seale	49	33
6x19 Seale	45	30
6x21 Filler Wire	39	26
6x25 Filler Wire	36	24
6x31	33	22
8x19 Seale	31	21
6x37	27	18
8x19 Warrington	27	18
Tiller Rope	18	12

faster speeds, are other reported features.

Hi-Torque is said to be unusually simple and easy to service. It requires no lubrication, eliminates mechanical shaft or cam alignment problems, and can be disassembled with standard hand tools.

Made in most popular sizes, the brake is bolted as a single unit to the axle or axle housing of the vehicle, and uses either the existing air supply or hydraulic power from the central system.

For further information write to B. F. Goodrich Aviation Products, Dept. C&E, Troy, Ohio, or use the Request Card at page 18. Circle No. 123.



Typical of the new series of truck bodies available from the Reading Body Works, Inc., is this ¾-ton service and utility unit. New structural features have been added to all 18 models in the Reading line.

Announce improved series of utility truck bodies

A new series of improved utility truck bodies is announced by the Reading Body Works, Inc.

Extra rigidity has been added to all 18 utility models by the addition of two full-width cross-sills. General construction of the bodies, which range from ½ to 1-ton units, is of 12, 14, and 16-gage steel, with understructure of 12-gage steel.

Compartment capacities range from 35 cubic feet in ½-ton models to 68 cubic feet in 1-ton models. The compartment doors are now equipped with stainless steel hinge pins, are double paneled, and have die-formed water traps to keep the compartments weatherproof.

These Reading all-welded units are designed for mounting on any standard chassis.

For further information write to Reading Body Works, Inc., Dept. C&E, Reading, Pa., or use the Request Card at page 18. Circle No. 24.

Announce accessories for aggregate testing screen

Several new accessories for its screen for size-testing sand and gravel, crushed stone, and all road aggregates are announced by the Gilson Screen Co.

The Gilson testing screen handles up to one cubic foot of sample, making two to seven separations simultaneously in three to five minutes, in a size range from 4 inches to 200 mesh. A sand attachment for use with 8-inch round sieves handles routine testing of fines.

The new Gilson optional equipment, designed to increase operating convenience during size-testing in the laboratory and in the field, includes a hydraulic clamping accessory for use with new or existing Gilson testing screens, a door enclosure accessory, a sample splitter, and tray racks for storage of screen trays.

In addition to the provision of these new optional extras, inside coating (for sound deadening) may now be specified on new screens. Also new is a standard flange furnished on the front edge of screen trays in certain sizes to prevent the possibility of sample pieces bouncing out.

For further information write to the Gilson Screen Co., Dept. C&E, 110 Center St., Malinta, Ohio, or use the Request Card at page 18. Circle No. 124.

Equipment-cleaning agent applied quickly, easily

Magnusol, an easily applied cleaning agent said to remove completely all dirt, grease, oil, and muck from equipment on or off the job, is announced by the Magnus Chemical Co., Inc.

For on-the-job cleaning, Magnusol is merely sprayed on and, after soaking, rinsed off with a pressure stream of water.

When used in the tank-soak method for cleaning parts, solutions may be used several times with no loss of strength. According to the manufacturer, cold tank cleaning with this agent is fast, with no waiting for solutions to heat.

Soluble in either solvent or water, Magnusol reportedly may be used safely for washing lacquered, enameled, or painted body surfaces.

Any suitable sprayer can be used for application.

For further information write to the Magnus Chemical Co., Inc., Dept. C&E, 22 South Ave., Garwood, N. J., or use the Request Card at page 18. Circle No. 93.

Tips

Excessive strength can make a rope "muscle-bound"... Wire Rope must be

BALANCED

Buying wire rope on the basis of strength alone leaves other important properties out of consideration. Wire rope, like athletes, can be "muscle-bound" with too much strength.

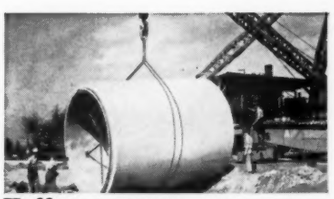
Strength is not always the answer to the question of the proper rope to use. Strength does not increase flexibility, resistance to crushing, abrasive or fatigue-resistant qualities. Strength does not compensate for the core crushing which accompanies excessive loading.

The Tuffy ropes are engineered for each end-use of the different types of rope. The combination of strength, toughness and flexibility is different for each application. The way to be sure your rope is BALANCED for its job is to use Union Wire Rope. Get in touch with your Union distributor.

Now to determine the relative service life of say a 6x37. Its bending life factor (see Table 2) is 1.33 as compared to 1.00 for the 6x25 filler wire. Multiply the service life readings of 14 and 25 for the 6x25 filler wire by 1.33, and we find the service life range of the 6x37 falls at 18 and 27 units of service. Relative service life of other ropes are determined in the same way by using the bending factor indicated for each as the multiplier.

Of course bending is not the only wear factor in wire rope operation. Hence the general rule—that more flexible ropes should be used as bending stress increases with decrease in diameter of sheave or drum—has to be modified in field use. Other principal operating conditions—in addition to bending stresses—that affect wire rope service life are loading conditions, portability, corrosion, abrasion, rope speeds, materials handled, and equipment design. You can get further information on all wear factors from your Union Wire Rope distributor or the Union Wire Rope Corporation engineering staff.

Tuffy Special Purpose Ropes: tailored and BALANCED for special uses



Tuffy BALANCED Slings & Hoist Lines

Top-performing team in every type of materials handling. Tuffy Slings are made of a patented, machine-braided fabric; stays extra flexible, can't be seriously hurt by knotting or kinking. Tuffy Hoist Line is a special construction of super flexibility and toughness.

Tuffy BALANCED Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built and balanced to take the beating of drum-crushing abuse.

Tuffy BALANCED Dozer Rope

Built to give you longer service with less downtime. 150' reels of 1/2" or 9/16" mounted on your dozers allow you to cut off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!

Tuffy BALANCED Dragline Rope

Made to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves; hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

Ordering is ABC-Simple!

No complicated codes or long list of specifications. Just say "Tuffy", give type (Scraper Rope, Dozer Rope, etc.), length wanted and size. Just that easy!

Good Man to Know: Your Nearby Union Wire Rope Distributor

Whether your wire rope need is a scheduled replacement or a red-hot emergency, your Union Wire Rope distributor is ready with "right-now" service. He keeps varied stocks of Union standard constructions and the Tuffy Special Purpose Ropes. And he's backed by quick service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. If you don't know your Union Wire Rope distributor already, look under "Wire Ropes" or "Slings" in your telephone directory yellow pages.

union Wire Rope corp.

2260 Manchester Avenue Kansas City, 26, Missouri

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

For more facts, use Request Card at page 18 and circle No. 283

This grapple-fork attachment, designed for use with the Versa-Lift truck-mounted crane, features jaws that open to a distance of 7 feet between the points. The jaws overlap when closed, leaving an opening 24 inches wide and 26 inches high.

Grapple-fork attachment for truck-mounted crane

Teale & Co. announces a new hydraulic grapple-fork attachment for use with the firm's heavy-duty, fully hydraulic Versa-Lift truck-mounted crane.

According to the manufacturer, the jaws of the unit open to a distance of 7 feet between the points. When closed, they overlap, leaving an opening 24 inches wide by 26 inches high between the jaws.

Two spring-loaded "take-up" reels keep slack out of the double wire-braid hose, and a heavy-duty swivel prevents the load from turning unless desired. The grapple-fork attachment weighs 730 pounds.

For further information write to Teale & Co., Dept. C&E, P. O. Box 308, Omaha, Neb., or use the Request Card at page 18. Circle No. 121.

Direct-pressure clutch has stamped steel cover

A 14-inch heavy-duty direct-pressure clutch for use in trucks and off-the-highway vehicles is offered by the Lipe-Rollway Corp.

Equipped with a stamped steel cover providing reduced weight and greater protection against centrifugal burst, the new clutch is available for use with flat or pot-type flywheels. ►

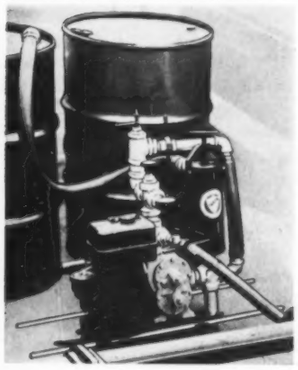
Drainage tile protected with glass fiber cover

Tile-Guard, a drainage tile cover made of materials specifically compounded to withstand underground alkalies and acids, is offered by the L. O. F. Glass Fibers Co.

According to the manufacturer, Tile-Guard is virtually ageless in comparison with commonly used organic protective materials.

The cover can be applied automatically by means of a simple spool arrangement attached to the ditching machine. It is anchored with a small amount of soil at the beginning of the ditch and unrolled continuously as the laying operation progresses.

For further information write to the L. O. F. Glass Fibers Co., Dept. C&E, 1810 Madison Ave., Toledo 1, Ohio, or use the Request Card at page 18. Circle No. 122.



Portable Vac-U-Sprayer (above). Powered by gasoline engine driven gear pump. Built-in material screen and by-pass. Sucks and sprays liquid material "direct from 55 gallon shipping drum" or larger storage. Cleans all lines in 3 minutes. Convenient to move and store. Simple to start. Easy to service. **Portable Vac-U-Sprayer sells for $395.00** f.o.b., plant. Write for details or see your nearest Tarco dealer.

TARCO

Sprayers

PRICED from $395.00 f.o.b.

Ideal for: **Curing Concrete. Construction** of driveways, parking lots, walks, tennis courts, roadways. **Repairing** pavement. **Painting** buildings, bridges, guard rails, equipment. **Sub-sealing** work. **Waterproofing** foundations and roofs.

Four models . . . spray direct from the shipping drum. Gasoline engine driven gear pump or air compressor. Wheel mounted (4 rubber tired wheels) or portable. Complete ready to work with all hoses, hand spray bar, nozzles.

TARRANT Manufacturing Company

29 Jumel Place Saratoga Springs, N. Y.

For more facts, use Request Card at page 18 and circle No. 284

Remove LIME and MORTAR Safely and More Effectively with the new substitute for muriatic acid.

"SAF-T-KLENZ" MASONRY CLEANER

Has the cleaning action of strong liquid acids but with the advantage of an extremely low corrosion rate. It has a pH value of 5.2. Comes in dry powder form and can be mixed with water to any desired strength. The solution is applied with a brush and then flushed off with clear water. Brushes last much longer.

Normally its dry powder form will not irritate skin of workmen, however if a slight irritation does occur it can be easily overcome by washing with water. DOES NOT GENERATE STRONG FUMES.

Does Not Injure or Discolor:

ALUMINUM • STAINLESS STEEL
BRICK • STONE • GLAZED TILE
GLASS BLOCK

Dissolves encrusted mortar and cleans mechanical mortar mixers, shovels, etc.

Eliminates
LIQUID SPILLAGE • CARBOY BREAKAGE
CARBOY DEPOSIT

A mixture of one pound of "Saf-T-Klenz" to five gallons of water is satisfactory for average conditions.

Use the easy to handle, easy to transport

"SAF-T-KLENZ" MASONRY CLEANER

Order Today

400 pound drum @ .42 per pound
150 pound drum @ .50 per pound
75 pound drum @ .55 per pound
F.O.B. Toledo

DEALERS!

Write regarding open territory

BERMAN Chemical Co.

1928 NORTH 12th ST. TOLEDO 4, OHIO

For more facts, circle No. 286

performance proves our point!

POINT: *Mobile Drill's B-36* Hydraulic Vertical Auger *drills faster, more efficiently, at less expense than any other drilling unit of comparable weight and size on the market.*

PROOF: *Dozens of reports from satisfied users in contracting, prospecting, foundation testing and other soils engineering fields . . . testimonials that tell of time-saving, money-saving revelations with the B-36 MOBILE DRILL.*

here's why they're happy . . .

1 FULL 6' STROKE: Up to *twice the speed* of comparable drills because of fewer stops to add auger sections.

2 8,000 LBS. HYDRAULIC RAM FORCE: Drives to depths of 100' using 6" augers, up to 500' in an average day's work.

3 SEPARATE DRILL CLUTCH: Saves wear and tear on vehicle clutch, gives greater speed and ease of operation.

4 CENTRALIZED 1-MAN CONTROL PANEL: Eliminates waste motion, minimizes injury risk from moving parts.

PROVE IT FOR YOURSELF—TODAY!
Write for free illustrated folder and complete specifications on the B-36 MOBILE DRILL to:

MOBILE DRILL

Mobile Drilling, Inc.
Dept. 20, 960 N. Pennsylvania Street
Indianapolis 4, Indiana

For more facts, use Request Card at page 18 and circle No. 285

Single or two-plate assemblies utilize single-plate cover assembly for flat flywheels. The two-plate clutch has slots rather than driving pins, engaging the intermediate plate to the flywheel. This slotting reportedly not only provides more driving area by eliminating driving pins but also helps prevent clutch drag. When the clutch is disengaged, the intermediate plate springs push the intermediate plate against a set of screw stops, providing positive separation.

For further information write to the Lipe-Rollway Corp., Dept. C&E, 806 Emerson Ave., Syracuse 1, N. Y., or use the Request Card that is bound in at page 18 of this issue. Circle No. 14.

This Model LCM-45 Dump-Master is fitted with an 8-cubic-yard rock body. The unit is designed for pit and quarry work, as well as for general construction hauling both on and off-the-road.

Announce new dump truck for sand and gravel work

The Crane Carrier Corp. announces a new dump truck designed for pit, quarry, and on-or-off-the-road construction hauling. Designated LCM-45 Dump-Master, the unit features an all-welded structural steel frame, and is fitted with an 8-cubic-yard rock body.

A short CA dimension allows more load to be applied to the front axle, thus giving improved weight distribution and more payload within the bridge-formula legal load limits of the various states, the company reports.

A heavier front axle is another feature, and rubber-mounted and rubber-bushed bogies eliminate wear points and the necessity of lubrication.

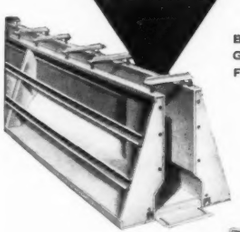
Standard equipment on the LCM-45 includes a Fuller 2-speed auxiliary transmission (main transmission is a Fuller 5-speed), and hydraulic steering. The unit is powered by an International Harvester Model RD engine.

The carrier's design is said to minimize sheet metal replacement, and the one-man cab gives greater visibility as well as permitting greater maneuverability with a substantial reduction in hauling time, according to the manufacturer.

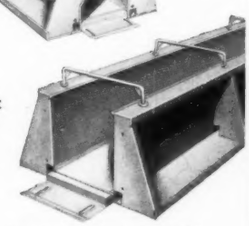
For further information write to the Crane Carrier Corp., Dept. C&E, P. O. Box 5008, Tulsa, Okla., or use the Request Card at page 18. Circle No. 86.

STAY AHEAD OF SCHEDULE WITH

WATCO STEEL FORMS



BRIDGE GIRDER FORM



SQUARE PILING FORM

On big volume bridge jobs you will be time and money ahead when you cast piling and girders in WATCO steel forms.

These forms are designed for mass production of all State Road Department and AASHO-PCI bridge girders. Available in 10 ft. sections which provide ease in handling in lengths up to 50 ft. — at any one time. Removable side forms enable you to turn over beds quicker and set up additional lines.

WATCO forms are a product of the pioneer organization in fabrication of steel forms for precast prestressed concrete. They offer vital advantages found in no other competitive equipment. One of our representatives will be glad to supply complete details. Write today for his assistance.

PLANT CITY Welding & Tank Co.
P. O. BOX 1308, PLANT CITY, FLORIDA

Member of Prestressed Concrete Institute

For more facts, circle No. 287

Need HOSE in a HURRY?

Suction • Water • Steam
Air • Multi-Purpose
Discharge • Pile Driver

Wherever your job is—*whenever* you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—*when* and *where* you want it.

There's no need to wait for distant shipments—no need to stop the job—no need to lose profits.

Any time you need hose call Continental. You'll like the fast service and dependable quality you get from these warehouses:

ATLANTA 8, Ga. 477 Eighth St., N.E.
BALTIMORE 18, Md. 15 East 21st St.
BOSTON (Alls.34), Mass. 12 Franklin St.
CHICAGO 10, Ill. 10 West Hubbard St.
CINCINNATI 2, Ohio 49 Central Ave.
CLEVELAND 15, Ohio 2731 Prospect Ave.
DETROIT 27, Mich. 13801 Schoolcraft Ave.
INDIANAPOLIS 4, Ind. 309 North Capitol Ave.
LOS ANGELES 23, Calif. 3121 East 12th St.
MEMPHIS 3, Tenn. 268 Madison Ave.
NEW YORK 7, N. Y. 81 Murray St.
PHILADELPHIA 6, Pa. 311 North Randolph St.
SAN FRANCISCO 24, Calif. 1352 Egbert Ave.
ST. LOUIS 8, Mo. 4018 Olive St.
SYRACUSE 3, N. Y. 739 Montgomery St.

CONTINENTAL STEAM HOSE

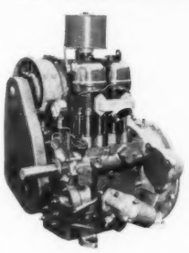
Built for work up to 100 p. s. i., this hose is tailor made with special heat-resistant rubber tube, plies of quality frictioned duck with heavy rubber separation and tough rubber cover. Sizes: ½", ¾", 1", 1¼", 1½", 2". Ask for catalog showing complete line of CONTRACTORS HOSE, HOSE FITTINGS, BOOTS and CLOTHING.

HOSE by CR CONTINENTAL

CONTINENTAL RUBBER WORKS • 1989 LIBERTY ST. • ERIE 6 • PENNSYLVANIA

For more facts, use Request Card at page 18 and circle No. 288

Powered by a Petter 125-hp PC2 engine



Petter

INTRODUCING A NEW LIGHTWEIGHT AIRCOOLED DIESEL ENGINE

The PC, an addition to the current range of Petter engines, is manufactured in 1, 2, 3 & 4 cylinders at a continuous speed of 3000 RPM and a horsepower rating of 6.25 per cylinder.

Now the right prime mover for concrete mixers, pumps, forklift trucks, dumpers, air compressors, cultivators, balers, combines, cranes, conveyors, refrigeration equipment and many other applications.

* * * * * * * *

Air & Watercooled diesel engines 3-200 HP Generating Sets 1½-120 KW

SHORT DELIVERY — EXCELLENT SERVICE FACILITIES

PETTER ENGINE DIVISION — BRUSH ABOE, INC.

60-07 39th Ave., Woodside, N. Y., DEfender 5-7100

For more facts, use Request Card at page 18 and circle No. 289

Device for preheating oil in bulk storage

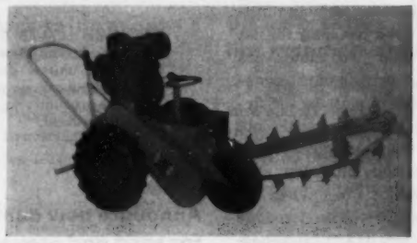
The Hot-Spot, a unit for pre heating heavy liquids contained in a bulk tank before entering the suction line, and said to be particularly effective for heating No. 5, No. 6, and Bunker C oils, is available from the Rempe Co.

The Hot-Spot is a shell and coil assembly, and is lowered into the tank through the manhole. Inlet and outlet pipes are provided for heating by steam or hot water. Holes for supply, return, and fluid suction pipes are made by drilling or torch-cutting in the manhole cover.

According to the company, a special flow accumulator causes the heavy oils or other liquids to flow over heated pipes before entering the suction line, making the job of the suction pumps an easy one. A constant supply of fuel which can be effectively atomized at the burners is assured.

The Hot-Spot is available in two sizes: a 16-inch-diameter shell for manholes with a 16½-inch opening and larger, and a 14-inch-diameter shell for openings 14½ to 16 inches.

For further information write to the Rempe Co., Dept. C&E, 340 N. Sacramento Blvd., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 125.



Optional features on new Model M Ditch Witch include dual wheels for drive wheels and front wheel. A master clutch for roading the machine with the digging chain stopped is also available.

Several new features announced for trencher

New features for its Model M Ditch Witch trencher are announced by The Charles Machine Works, Inc.

According to the manufacturer, the unit now has as standard equipment a Wisconsin AENL 9.2-hp air-cooled engine; larger 6-12 drive wheels for better traction; a clutch link that quickly adjusts for drive-belt stretch; and two types of digging teeth—cup cutters and chisels.

Optional features on all new Model M trenchers include dual wheels for both drive wheels and front wheel for maximum flotation and traction, as well as a master clutch for use in roading the machine with the digging chain stopped.

The standard Model M Ditch Witch reportedly digs a 6-inch maximum width trench to a maximum depth of four feet.

For further information write to The Charles Machine Works, Inc., Dept. C&E, 636 B St., Perry, Okla., or use the Request Card that is bound in at page 18 of this issue. Circle No. 54.

Concrete-cutting blade available in two types

A concrete-cutting blade said to substantially reduce cutting costs, especially in contraction joint sawing in new concrete, is announced by the Clyde Co.

Designated Duo-Bond, this new blade nearly doubles the cutting speed normally obtained heretofore, the manufacturer states. The increased cutting speed and reportedly longer blade life are attributed to a new-type diamond bond that provides an exceptionally tough cutting edge.

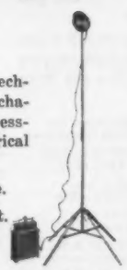
The blades are available in two types. For use in repair and maintenance work, Clyde features a thin blade especially designed for old hard concrete. For sawing joints in green concrete, a blade of greater width is offered, so designed to provide a cut sufficiently wide for easy application of all joint-sealing materials, according to the manufacturer.

Duo-Bond blades are offered in 12 and 14-inch diameters, and are said to fit any make of concrete-sawing machine.

For further information write to the Clyde Co., Dept. C&E, 500 College Ave., Racine, Wis., or use the Request Card that is bound in at page 18. Circle No. 128.

Escolite—BETTER BRIGHTER

- Brighter light.
- More economical to operate, less initial investment.
- Heavy-duty time-proven flasher mechanism. Electromagnetic pulse mechanism in Escolite has been used successfully for 20 years in other electrical control products.
- Heavy-duty neophrene sealed case.
- Complete line of flasher equipment. Transistorized lights available.

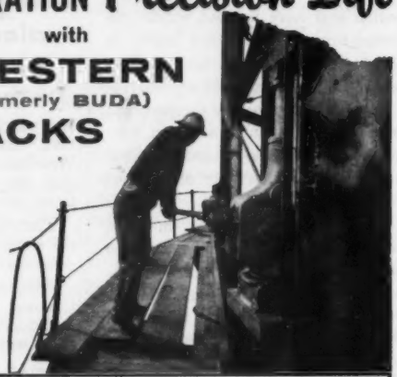


Write for literature and prices. Distributorships available.

ELECTRONIC SPECIALTIES COMPANY
BATAVIA 12, ILLINOIS

For more facts, circle No. 290

OPERATION Precision Lift with WESTERN (Formerly BUDA) JACKS



Raise 1,000,000 gallon tank 25 feet ¼₄ inch at a time!

Twelve 75-ton WESTERN jacks were used to raise this 416-ton water tank 25 feet. A height indicating gauge at each jack kept the tank precisely level and weight evenly distributed through 19,500 jack strokes. One of the many lifting operations possible with WESTERN'S 145 models in 9 different types.

See your local distributor 8840

WESTERN INDUSTRIES INC.
Industrial Division, 2400-2434 S. Ashland Ave., Chicago 8, Ill.

For more facts, circle No. 292

KROIL CREEPS IN

loosens frozen parts

18,000 industrial users depend upon this amazing new chemical tool when some frozen parts tie up valuable machinery or threaten production. They say . . .

"Kroil will loosen almost anything from an embalmer's needle to a bulldozer."
"We have excellent results loosening stuck slides on musical instruments."
"On a 25-year-old Bessemer gas engine, two bolts twisted off before . . . after using Kroil, they all came out easily."
"Before trying Kroil on heat treat trolleys we broke off every nut . . . since then, we have not lost one."

You too can get these results. Try KROIL on money-back basis. Gallon, $4.00; with Kroiler squirt gun, $4.95, f. o. b. factory.

Ask for GENIUS AT WORK—a free publication full of ideas for maintenance men.

KANO LABS. 1057 Thompson Lane Nashville 11, Tennessee

For more facts, circle No. 291

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PLAN HOLD holds plans, prints, maps, drawings, etc., up to 48" wide — and holds them better than any other method. Standard PLAN HOLD fits most racks now in use. Also available are PLAN HOLD wall racks, rolling stands, carousel units, cabinet units, etc. Order from your Blue Printer, Engineering or Office Supply Dealer, or write for Catalog No. 7.

PLAN HOLD® CORPORATION SOUTH GATE, CALIF.

For more facts, circle No. 293

Tank-mounted compressors operate at 100, 200 psi

A new line of tank-mounted rotary compressors in 2, 3 and 5-hp models is announced by the Davey Compressor Co.

Designated Davey Hydrovane rotary units, they operate at 100 and 200 psi. Reportedly free from vibration and extremely quiet in operation, they are also said to be very easy to install, requiring no special compressor rooms or foundations. The units are completely enclosed, have no belts or couplings, and are available with either vertical or horizontal tank mountings.

Other features include a lightweight, compact design, as well as a minimum of working parts to insure a longer, more efficient operating life. Modulation, start-stop, or combination modulation and start-stop unloading mechanisms can be furnished.

For further information write to the Industrial Division, Davey Compressor Co., Dept. C&E, Franklin Ave., Kent, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 76.

A fully automatic transmission is now available for the recently introduced Yale line of G-3 gasoline-powered 15,000 to 20,000-pound-capacity industrial lift trucks. According to the manufacturer, the transmission is a combination of a torque converter and a planetary transmission, and offers two forward speed ranges and two reverse to suit all handling situations. Range changes reportedly can be made at full throttle without interrupting the power flow from the engine to drive wheels. For further information write to the Yale & Towne Mfg. Co., Dept. C&E, 11,000 Roosevelt Blvd., Philadelphia 15, Pa., or use the Request Card at page 18. Circle No. 9.

FAST - PROFITABLE DIGGING!

STERLING

HYDRAULIC CONTROL

EARTH BORING MACHINES

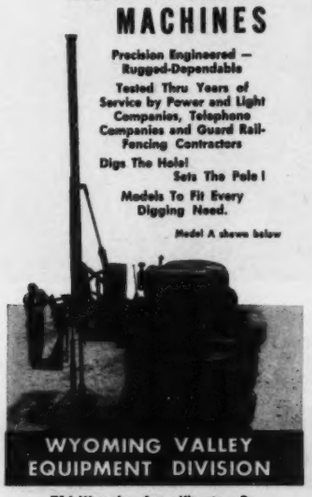
Precision Engineered — Rugged-Dependable

Tested Thru Years of Service by Power and Light Companies, Telephone Companies and Guard Rail-Fencing Contractors

Digs The Hole! Sets The Pole!

Models To Fit Every Digging Need.

Model A shown below



WYOMING VALLEY EQUIPMENT DIVISION

714 Wyoming Ave., Kingston, Pa.
Telephone: BUtler 7-3138

For more facts, circle No. 294

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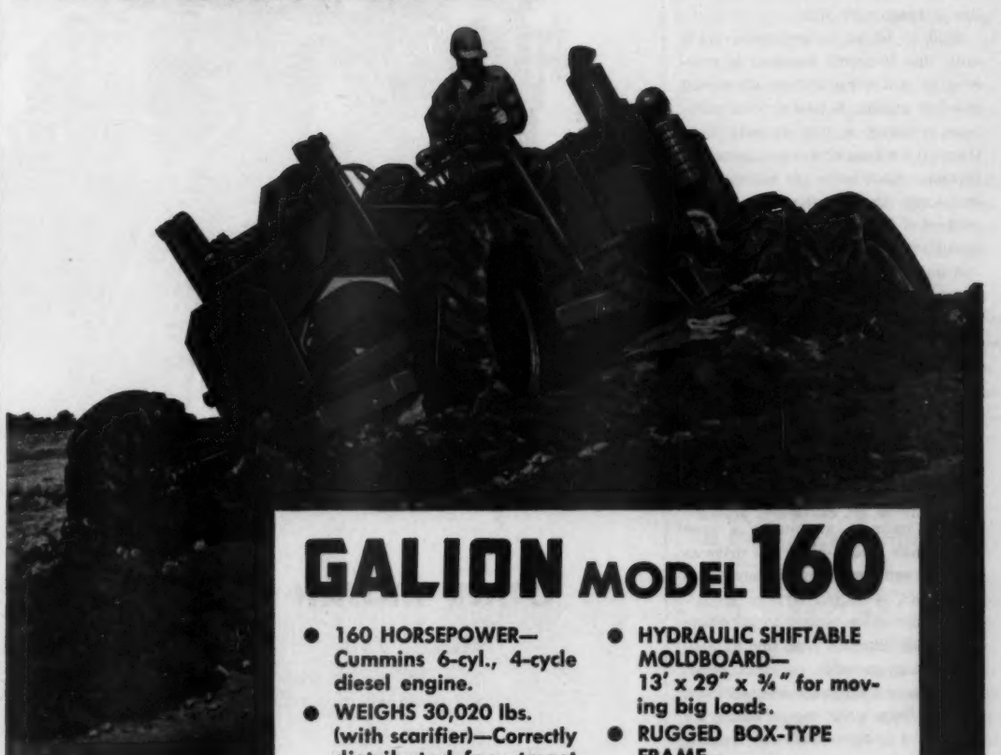


GALION MODEL 160

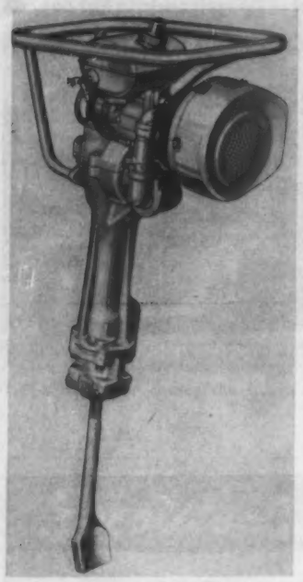
- 160 HORSEPOWER— Cummins 6-cyl., 4-cycle diesel engine.
- WEIGHS 30,020 lbs. (with scarifier)—Correctly distributed for utmost tractive effort.
- CONSTANT-MESH TRANSMISSION— Six overlapping forward and two reverse speeds.
- HYDRAULIC SHIFTABLE MOLDBOARD— 13' x 29" x ¾" for moving big loads.
- RUGGED BOX-TYPE FRAME— Weighs 134 lbs. per foot.
- FOUR-WHEEL BRAKES.
- 14.00 x 24 TIRES— Front and rear, interchangeable.

Write for Bulletin No. 421.

THE GALION IRON WORKS & MFG. CO.
General and Export Offices—Galion, Ohio, U. S. A.

GALION ESTABLISHED 1907 MOTOR GRADERS & ROLLERS

For more facts, use Request Card at page 18 and circle No. 295



Announce newly designed portable power hammer

A newly designed portable power hammer is available from the Machinery Division of Racine Hydraulics & Machinery, Inc.

Said to be an extremely versatile unit, this 60-pound hammer is powered by a 1¼-hp 2-cycle air-cooled gasoline engine. A new driving principle, creating a high-velocity blow through a spring and crank assembly, furnishes 1,500 blows per minute with less wear on tools than the direct-connected hammer, according to the manufacturer.

A quick-opening tool chuck is said to permit 15-second changes of tools.

For further information write to Racine Hydraulics & Machinery, Inc., Dept. C&E, 2000 Albert St., Racine, Wis., or use the Request Card at page 18. Circle No. 72.

Torque-converter drive offered for lift trucks

Allis-Chalmers announces a new power-shift torque-converter drive as optional equipment on the company's lift trucks.

The new drive is said to facilitate controlled "inching" of the unit to enable the operator to stack loads faster, more accurately, and with less fatigue. Even while maneuvering his truck into position with the inching pedal, he can maintain engine speed with the foot accelerator and obtain maximum speed to lift the load he is stacking, according to the manufacturer.

Increased safety of operation is afforded by a forward and reverse direction selector mounted to the left on the steering wheel.

Another feature of the drive is that the transmission automatically returns it to neutral whenever the operator leaves his seat.

For further information write to the Allis-Chalmers Mfg. Co., Dept. C&E, P. O. Box 512, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 133.

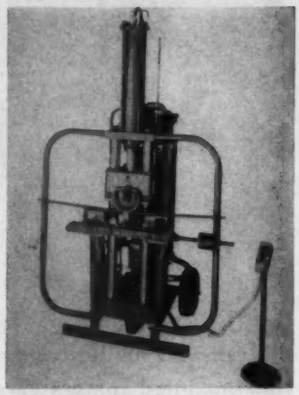
Vertical ram-type bender is push-button controlled

A vertical ram-type hydraulic bender for press bending is announced by the Wallace Supplies Mfg. Co.

Designated Wallace No. 1402, the unit occupies 100×45 inches of floor space, and reportedly bends up to 2-inch heavyweight steel pipe, to 180 degrees, with no reposition of dies or relocating of material. Coils, return bends, special curves, angle irons, channels, reinforcing bars, flat bars, and many others can be bent on this machine. A simple initial setting of the duplicator stop will make an unlimited number of the same bends, if desired.

According to the manufacturer, the unit is push-button controlled for maximum production output, with a "jog" button provided to facilitate setups quickly from field measurements or "lifted" bent-wire templates.

For further information write to the Wallace Supplies Mfg. Co., Dept. C&E, 1304 Diversey Pkwy., Chicago 14, Ill., or use the Request Card at page 18. Circle No. 60.



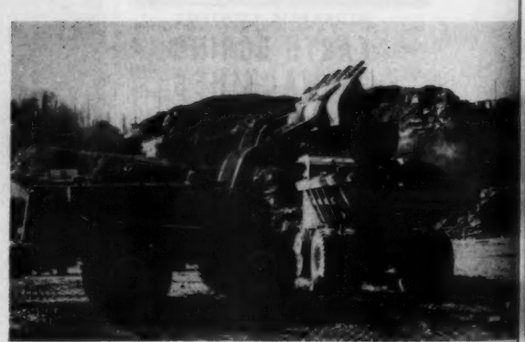
The Newest, Largest From ...MEET THE

OTHER TROJAN MODELS

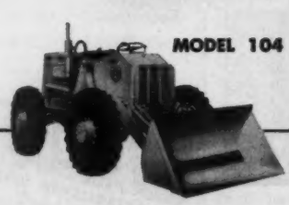
MODEL 154
2 cu. yd. cap., 4-wheel drive with Torqmatic transmission.

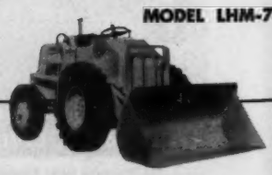
MODEL 104
1½ cu. yd. cap., 4-wheel drive with Torqmatic transmission.

MODEL LHM-75
1¼ cu. yd. cap., 2-wheel drive with torque converter.

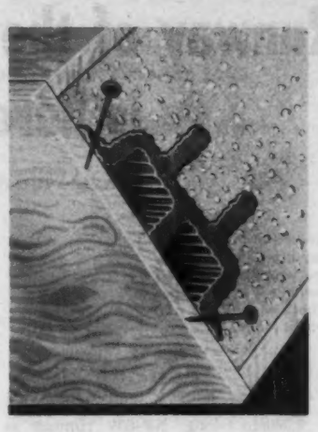


MODEL 154


MODEL 104


MODEL LHM-75

Concrete bonding device makes waterproof union



A device for making a waterproof union between two separate pours of concrete is available from Water Seals, Inc.

Designated Labyrinth Waterstop, the unit is made of polyvinyl plastic, and reportedly may be installed in a matter of seconds.

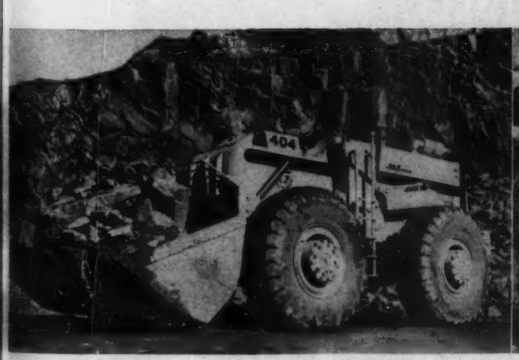
In its simplest dimension, the Labyrinth Waterstop forms a section 3½ inches wide and 1⅝ inches high, with walls and projecting ribs ¼-inch thick. A flange is provided on each side for nailing. The projecting ribs are somewhat enlarged at the ends, so as to provide a dovetail effect when embedded in concrete. The entire surface is corrugated to provide a secure hold in the concrete, thus forming a complete watertight bond.

According to the manufacturer, the polyvinyl plastic is flexible and tough enough to stand up under expansion and contraction. It is not affected by temperature changes nor by any acids normally encountered, and is extremely resistant to aging. A special advantage is said to be its ability to be fused together, forming a tough bond.

For further information write to Water Seals, Inc., Dept. C&E, 9 S. Clinton St., Chicago 6, Ill., or use the Request Card at page 18. Circle No. 126.

Power Package
YALE & TOWNE
TROJAN 4 CU. YD. MODEL 404

Newest and largest—this describes perfectly the Trojan Model 404 tractor shovel . . . This 4 cu. yd. power package is a machine that will top the operating demands of even the hardest users . . . and deliver tremendous yardages with minimum effort . . . Like the 154, 104 and LHM-75, the same high standards of workmanship and materials have gone into the new '404' plus the ability to deliver the same superior performance on the really big jobs. Like all Trojan models, safety is of prime concern and the '404' also features reverse curve safety arms and such job-proven operating aids as low-load carrying position, independent bucket action, straight line horizontal thrust, automatic neutral return and four wheel air brakes . . . Power is supplied by a GM series 6-71 diesel—an economical, low-maintenance power supply. Ask for a '404' demonstration any place—any time!



TROJAN YALE & TOWNE

TROJAN* *REG. U. S. PAT. OFF.

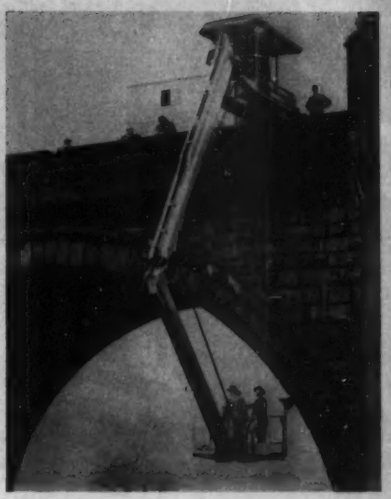
YALE & TOWNE

TRACTOR SHOVELS

2 & 4 Wheel Drive Front-End Loaders

CONTRACTORS MACHINERY DIV., THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK; SAN LEANDRO, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 296



This new rig developed by British Railways carries two inspectors 15 feet underneath the bridge arch. The rig permits British Railways' engineers to do in hours work that formerly took days or weeks.

New device speeds bridge and viaduct inspection

British Railways has developed and put into service equipment for speedy inspection of viaducts and high-level bridges. The rig, mounted on a 52-foot-long railway car, reaches over the side of a high-arch viaduct or bridge.

Two arms, 17 and 21 feet long, unfold to carry examiners 29 feet below rail level or 15 feet under the arch. The examiners descend in a cage attached to the lower arm and, with three levers, remotely control the movements of the cage under the arch and the freight car on the track above.

For night inspection, floodlights are fitted on the cage and car, where a unit generates electricity. Power tools for repair work can be operated from plug points on the cage. The men in the cage use portable field telephones to contact the men in the freight car cab.

Cash awards to winners of design competition

Cash awards totaling $5,000 are offered by The James F. Lincoln Arc Welding Foundation to winners of its annual mechanical and structural design competition. Open to undergraduates in engineering and architectural schools only, the competition offers awards for the best designs of a machine or machine part, structure or structural component, which make a significant use of arc welding.

In addition, scholarship funds are granted to the schools in which the winners of the three grand awards are registered. Rules are available from the Foundation, Cleveland 17, Ohio.

L. B. Foster moves office

The Los Angeles, Calif., offices of the L. B. Foster Co. have been moved to the new 13-story Tishman Building, 3540 Wilshire Blvd., Los Angeles. The firm is a supplier of steel sheet piling, pipe, and highway products.

Runway of the future is here today

Concrete batches delivered to the paver at one end of the runway are mixed for construction of a concrete warm-up pad. The reinforced-concrete pavement is 12 inches thick for 750 feet at both ends of the runway to take heavy wheel loads.

The construction news in the new 7,300-foot-long, NE-SW runway at the Indianapolis Municipal Airport are the reinforced-concrete pavement, the three banked turn-outs for the new jet planes, and an experimental runway lighting system.

Throughout this $1,553,335.40 project, close teamwork on the part of airport officials, engineering consultants, and the contractor kept work on schedule without disturbing regular air traffic.

Men in the airport control tower and in airport radio cars worked together with the contractor's flagmen to get heavy equipment safely across taxiways and runways that were in use. During the job, both Gast Construction Co., Warsaw, Ind., the prime contractor, and E. E. Schnitzius Co., Indianapolis, subcontractor on the grading, worked only 500 feet away from the runway carrying heavy commercial plant traffic.

The new runway was paved with portland-cement concrete, reinforced with welded-wire fabric, in six 25-foot lanes for the 150-foot width of the runway. These lanes are key-locked longitudinally, and outside lanes are also tied by steel bars that will prevent any lateral movement. For 750 feet at both ends, where the full impact of repeated wheel loadings and vibrations is registered, the runway is 12 inches thick over a select subbase. In the central portion, the four inside lanes are 10 inches thick and the two outside lanes are 8 inches thick.

Concrete developing a high strength was used for the runway and turnoffs. A cement-dispersal agent speeded the strengthening, while a retarder helped control curing. Steel fabric for the 12-inch-thick pavement weighed 86 pounds per hundred square feet, while the 10 and 8-inch-thick slabs were reinforced with steel-wire fabric weighing 74 pounds per hundred square feet. This reinforcing is designed to increase the pavement's ability to resist destructive, crack-producing loads by as much as 30 per cent.

Two pavers work

Two Rex dual-drum pavers were used to place the two lifts of concrete to the full depth of the slab. Immediately after the first paver came a spreader to strike off the concrete. After the welded-wire fabric reinforc-

What you should know about

MIL-CARB® "NUBBIN" WASHERS for High Strength Bolted Steel Construction

The word "Nubbin" on the container and the nubbin on the rim of the washer are the trade-mark symbols indicating *quality* washers manufactured by WROUGHT WASHER MANUFACTURING CO.

All washers having a nubbin on the outer rim, as shown in the accompanying illustration, are heat-treated washers manufactured by the Wrought Washer Mfg. Co. for use in connection with high strength bolted steel construction or other purposes for which they may be designated.

This is our own exclusive product and trade-mark. It signifies that washers so identified are manufactured to our high standards, insuring uniform quality control, always *equal to* or *exceeding* the rigid specifications that have been established for high strength bolted steel construction (ASTM designation: A325, applying to nuts, bolts and washers).

All "Nubbin" Washers are fabricated from Special Soundness Steel to provide washers comparable to the best nuts and bolts in high tensile strength and permanent non-galling holding power.

[**For your own protection, to insure uniformly sound construction, specify Milwaukee Wrot Washers with the "Nubbin" trade-mark on the rim . . . the symbol of *quality*.**]

Since 1887

Distributed by

Leading Nut and Bolt Manufacturers and

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WROUGHT WASHER MANUFACTURING CO.

The World's Largest Producer of Washers

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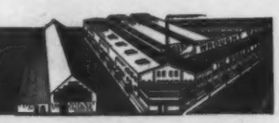

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L-20 White ASPHALT PLANT

PAYS FOR ITSELF IN 38 DAYS!*

** $13,900 F.O.B. Elkhart is price of portable model illustrated. Stationary model, $13,400 F.O.B. Complete, ready to operate. Prices subject to change without notice.*

Make your own hot mix asphalt with this new WHITE plant and save up to $2.30 a ton. At its capacity of 160 tons an 8-hour day, that's a savings of $368.00 a day. Thirty-eight of those days pays for the L-20!

Produce any type mix you can get from a $100,000 plant: hot, RC, MC, SC and emulsified for top course, base course, one course, or patch. Two men operate. Capacity is rated at a hot 325 degrees.

The L-20 will supply black-top for suburban streets, driveways, parking lots, school yards, or state highway maintenance.

See your nearest distributor or write direct for full information.

White Manufacturing Company, Elkhart 9, Indiana

For more facts, use Request Card at page 18 and circle No. 298

Reinforced-concrete runway designed to take commercial jets; experimental center-line lights are installed flush with pavement

Two Rex pavers complete the paving of the new 7,300-foot runway at the Indianapolis Municipal Airport. The Jaeger spreader strikes off the first lift, and welded-wire fabric reinforcing is placed before the second Rex comes along.

ing had been placed atop the first lift, the second Rex paver placed concrete to the tops of the forms. It was followed by a second spreader and strike-off. Both Blaw-Knox and Jaeger spreaders were used. A Jaeger-Lakewood transverse finisher and a Koehring longitudinal finisher followed. A hand-finisher, a contractor-built belting machine, and a burlap drag applied the final finish to the surface before a spray rig covered the fresh concrete with curing compound.

Weakened-plane contraction joints were sawed in the slab at 75-foot intervals, where load transfer assemblies were located. These had 1-inch, smooth, round bars, which were embedded in the concrete to join the slabs after joints had been sawed. The slabs have no expansion joints to create bumps. Except for the 12-inch-thick section of pavement, each 25-foot-wide lane was sawed longitudinally down the center.

Beam tests

Test beams of the high-strength concrete, broken at 7 days, showed a strength of 600 psi against a specified flexural strength of 700 psi in 28 days. On this job, a beam test room was ingeniously contrived from old truck beds. These were embedded in the earth and covered by a framed, insulated heater. Test beams were cured in water that was kept at a constant temperature of 72 degrees by a Silent Glow thermostatically controlled kerosene heater.

Banked turn-outs

The runway was constructed with three banked turn-outs that will make it possible for new jet planes to land and get clear of the runway at speeds up to 63 mph.

This, in turn, will make it possible for the airport to accept one plane every 30 seconds in good weather. When instrument landings are being made, the airport will be able to accept one plane every three minutes.

Unlike high-speed turn-offs built on a level, which limit the speed of a plane making a turn, the Indianapolis turn-outs are "super-depressed". That is, the inside edges are a foot lower than the outside of the curve.

In landing, a plane will cross the center line of the roadway and, as it wheels into a curve, be gently tilted into a banking position by the crown

(Continued on next page)

CUT COSTS
with the NEW
HOBART WELDERS
YOU'LL SAVE HUNDREDS OF DOLLARS DOING YOUR OWN ARC WELDING!
300 amp. Gas Drive
Air Cooled Lightweight Model
Water Cooled Gas Drive
Self Propelled
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USE THE HANDY COUPON
You know how costly breakdowns are—the delays, replacement parts, the slowing up of important work schedules. You can eliminate all of these inconveniences with a Hobart portable welder. With an efficient Hobart you can weld anywhere, any time—do your own repairs quickly, in any part of your plant or project—independent of electric power lines. In addition, these Hobart welders can supply power for running tools, lights, motors, etc. Better check into these money saving Hobart welders. The coupon below will bring you complete information—quickly and without obligation.
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FREE Welder's Vest Pocket Guide
300 amp. gas drive
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air cooled lightweight
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UNIT provides ample power maneuvers easily

Here is the ideal crane for placing pipe exactly where you want it...and placing it FAST. This sturdy, dependable machine provides easy maneuverability, plus precision-steadiness. The safety-promoting FULL VISION CAB gives the operator an unobstructed view of the entire operation, at all times. Makes pipe-positioning more efficient, safer, more profitable to all concerned. On other jobs, too, UNIT is equally satisfactory. It will pay you to investigate.

UNIT Models are available in ½ or ¾ yard Excavators... Cranes up to 20 tons capacity... Crawler or Mobile type... Gasoline or Diesel. All models convertible to all attachments.

UNIT CRANE & SHOVEL CORP.
6309 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

Geared for Maximum Lifting Jobs

For more facts, use Request Card at page 18 and circle No. 300

of the runway. This banking curve is continued into the "super-depressed", curved taxiway that follows a 955-foot-radius arc.

Flush center-line runway lights

More than the banked turn-outs are new at the airport. The city-owned facility, one of the country's few self-supporting airports, has long been a leader in joint airways research and experimentation with the Civil Aeronautics Administration. The newest feature at the airport is center-line lighting. Already used in Europe, this type of lighting has been installed on the runway and one turn-off on an experimental basis.

In contrast to the conventional runway lights—which are located about 18 inches above the ground on either side of a runway—12 white lights have been countersunk at 100-foot intervals along the center line of the strip. A line of blue lights has been installed flush along the center line of one of the high-speed turn-offs so that it peals off from the line of white lights. A light bar of three blue lights, also countersunk in the runway, marks the intersection of runway and high-speed turn-off center lines. A countersunk, flashing blue light has been installed 500 feet ahead of the turn-off to warn the pilot of the coming turn.

In practice, the pilot will put the nose of his ship on the line of white lights and peel off at 60 mph onto the turn-off by following the line of blue lights.

This experimental lighting installation, made by the CAA Technical Development Center, is designed to test the performance of flush lights under all weather conditions, as well as their effectiveness in helping pilots clear runways fast during periods of heavy traffic. Right now, the CAA is considering the possibility of painting the runway and turn-off with white and blue center-lines to help pilots make landings during daylight hours.

While the new runway was being constructed, the existing Northeast-Southwest strip was lengthened to 7,300 feet and converted into a parallel taxiway to serve the new runway. Built of 12-inch-thick concrete, reinforced with welded-wire fabric, the new taxiway is designed to withstand the full wheel loads of the heavy jet-age planes, some of which will be twice as heavy as the largest propeller-driven craft in use today.

Harry Weese was general superintendent for the prime contractor, Gast Construction Co. The unique turn-offs were designed by A. W. Compton of Clyde E. Williams & Associates, Inc., South Bend, Ind. D. R. Parsons was resident engineer for The Clyde E. Williams firm. The separate lighting contract, amounting to $72,000, was handled by Harris-McBurney Co., Jackson, Mich. Installation was under the supervision of CAA's Raymond C. Herner of the Indianapolis Technical Development Center.

Fred W. Sommer is president of the Indianapolis Board of Aviation Commissioners, and Donald E. Tharp is acting superintendent. THE END

Survey finds mature labor in iron, steel industry

There is a stable and relatively mature labor force in the iron and steel industry, according to an American Iron and Steel Institute survey based on 88 per cent of the steel industry's employment. Data showed that the average age of steel employees in 1956 was 42, and the average length of service was 13 years.

Twenty-seven steel workers out of each thousand are over 65 years of age and are actively employed although eligible for social security and company-paid pension benefits. The survey also showed that 13 per cent of all steel industry employees had been hired after 40 years of age. Nineteen per cent of hourly steelworkers were in the age range of 18 to 29 years; 27 per cent in the age range of 30 to 39; and 26.5 per cent in the age range of 40 to 49.

Pa. highway department revises maintenance setup

A reorganization of the Pennsylvania Highway Department's field maintenance force is designed to increase road maintenance efficiency by 50 per cent.

Under the new system caretakers in charge of four men and a pickup truck will be replaced with foremen in charge of 10 or more men equipped with all necessary tools and vehicles for the job. Crews will perform maintenance and construction work wherever needed, and equipment need never stand idle since there will be enough men to keep the job moving.

In general, foremen will be selected by the county maintenance superintendent from the caretakers. Caretakers who are not made foremen will become equipment operators or laborers, or both, at the wages of the job they handle.

ASCE has 40,000 members

The American Society of Civil Engineers, oldest national organization of engineers in the U. S., has passed the 40,000 mark in membership. The society has 75 regional sections and 63 branches; its members, all qualified engineers, are located in 101 countries besides the U. S.

The deep, full-length, girder type, I-beam rails and full-width, I-beam crossmembers are welded together for the same type of powerful structural steel construction used in many modern bridges.

The rugged, indestructible, I-beam steel rails provide the same extra strength and stability in the husky new Workhorse that they do in structural steel bridges.

FRUEHAUF TRAILERS

FRUEHAUF BUILDS THE HAULING INDUSTRY'S BIGGEST LINE OF RUGGED CONSTRUCTION TRAILERS!

CABLE DUMPS

HOIST DUMPS

CARRYALLS

BULK CEMENT TANKS

Avoid legal pitfalls

California contracts

THE PROBLEM: *A California statute says that a written contract can be modified only by a written agreement or fully performed oral agreement. Under a written contract, the defendant, a general contractor, employed the plaintiff for a year as an estimator and office manager, at a weekly salary and 30 per cent share of net profits. The employment continued for two months after the year expired without any new written contract. Was plaintiff entitled to a share of profits under an oral agreement covering the two months?*

THE ANSWER: Yes. (McKeon v. Giusto, 280 Pac. 2d 782, decided by the California Supreme Court.)

The court said that the evidence showed that there had been a new and oral agreement for employment after the written contract had expired. The statute did not preclude an independent oral agreement. If at the end of the year, when the written contract expired, the parties agreed that it should be continued, a writing would have been necessary. The evidence did not show such intention, but rather, new employment on somewhat changed terms, including an oral agreement that plaintiff should share the profits until completion of building projects commenced before the written contract expired.

Because many may find it to be useful in the formation of employment agreements involving profit-sharing as well as salary, the full text of the agreement in the California case is appended. However, if there is any doubt as to the advisability of following the form literally in a particular instance, local legal counsel should be consulted. The agreement was in the form of a letter written by the employer:

"I hereby offer to employ you as an estimator and office manager in my general contracting business for a period of one year commencing January 1, 1951, and ending December 31, 1951, upon the following terms and conditions:

"1. I agree to pay you a salary of One Hundred Dollars ($100) per week, together with a sum which when added to the aforesaid salary will equal thirty (30) per cent of my net profits from said business, before income taxes, but after deducting all charges and expenses, during said year, and computed as hereinafter set forth. Said additional sum shall be payable annually after the completion of the annual audit of the books of my business, but in any event before March 1, 1952.

"2. In computing the said net profits there shall be excluded all payments received by me from the Drs. A. and E. Torre for the construction of a building at Gough and Union Streets in San Francisco, California. There shall be included in computing the net profits, if any, the amount due on all the jobs which have been fully completed during the year 1951, but on which full payment may not have been made during said year; provided, however, that your share of any net profits resulting from said jobs shall not be payable until final payment on such jobs has been received.

"3. It is understood that in determining the net profit from said business all computations shall be based on [an accrual] basis of accounting and that the books shall be audited on a calendar year basis. The final audit as presented by the accountants shall be conclusive and final in determining net profits.

"4. It is agreed that in the event you continue in my employ after December 31, 1951, it shall be at a salary of One Hundred Dollars ($100) per week plus only such amounts, if any, as may hereafter mutually be agreed upon in writing.

"5. The foregoing agreement is intended to supersede the oral agreement under which you entered my employ on August 1, 1950 * * *.

"The Foregoing Terms are hereby accepted and confirmed. [signed] E. F. McKeon."

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Mistake in fill yardage

THE PROBLEM: *Army engineers estimated that 22,000 cubic yards of material would be required to fill a gap in a levee. The prime contract*

The longitudinal steel I-beam rails actually become part of the Trailer floor in the new Workhorse Platform, and directly support lift trucks and loads!

The New Fruehauf Workhorse Platform Is Tough As A Bridge!

. . . yet saves up to 1,200 pounds in weight

The new Fruehauf Workhorse Platform is built for strength, lasting power, and big weight savings.

Its deep, deep 19½" I-beam channels directly support loads, lift trucks, and all the forces that tax and strain platform strength.

They do the job, and last, because they're extra deep, continuous, forged of the toughest low alloy, high-tensile steel.

Rugged, full-width I-beam crossmembers at 18" intervals increase rigidity and carrying capacity. Everything about the Workhorse is designed for top payloads and hard work.

Call your Fruehauf Branch while you're thinking of it now for a complete look at the toughest platform built!

Fruehauf Trailer Company, 10949 Harper Avenue, Detroit 32, Michigan.

FOR FORTY-FOUR YEARS MORE FRUEHAUF TRAILERS ON THE ROAD THAN ANY OTHER MAKE!

World's Largest Builder of Truck-Trailers
FRUEHAUF TRAILER COMPANY
10949 Harper Avenue • Detroit 32, Mich.

√ SEND ILLUSTRATED LITERATURE GIVING MORE FACTS ABOUT THE NEW FRUEHAUF WORKHORSE PLATFORM AT ONCE.

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ STATE_____

For more facts, use coupon or Request Card at page 18 and circle No. 301

called for payment on a yardage basis, but a subcontractor undertook to do the work for $8,250. Performance required 32,248 yards. The subcontractor did not sue to cancel the contract or to have its terms equitably modified by a court on a theory of mutual mistake as to the quantity required. Instead he sued to collect for the excess yardage as extra work not covered by his contract. Was he entitled to collect?

THE ANSWER: No. (Tower Contracting Co. v. Flores, 302 S. W. 2d 396, decided by the Texas Supreme Court.)

The court in effect said that the subcontractor gambled on whether the yardage would prove to be less or more than estimated by the engineers.

Subs collect pay for changed work

THE PROBLEM: *Subcontractors were affected by more than 6,000 substantial changes made in plans and specifications for a Veterans' Hospital in Utah. Were the general contractors and their sureties liable for the reasonable value of the extra services involved?*

THE ANSWER: Yes. (Wunderlich Contracting Co. v. United States, 240 Fed. 2d 201, decided by the United States Court of Appeals, Tenth Circuit, upholding a judgment granted by the United States District Court for Utah.)

The Court of Appeals incidentally said that a bidder for work is entitled to rely upon the plans and specifications on which his bid is based as fixing his rights. He is entitled to additional pay if burdens other than those imposed by his contract are thrust upon him. Ordinarily, the reasonable value of extra services and materials not called for by the contract measures the amount collectible. (Of course, a contract may specifically provide what pay is to be received for changed or extra work.)

The subcontractors were entitled to interest on the balance due them from the date when their work was completed and payment was due.

Workmen's compensation case involved psychosis

THE PROBLEM: *When a construction worker is accidentally injured, his right to a workmen's compensation award usually depends upon physical injury or injury to his nervous system. In an exceptional case in Florida, an illiterate worker sustained no serious bodily injury when he was holding a dragline, the boom of which contacted an overhead high tension wire. An electric current passed through his body, but there was no injury to his nervous system. But he became disabled for work because he believed that God delivered the stroke to punish him for his misconduct. The Florida Workmen's Compensation Commission awarded compensation on a basis of permanent partial (10 per cent) disability. On the medical and other evidence produced at the trial was the award erroneous?*

THE ANSWER: Yes. (Moses v. R. H. Wright & Son, Inc., 90 So. 2d 330, decided by the Florida Supreme Court.)

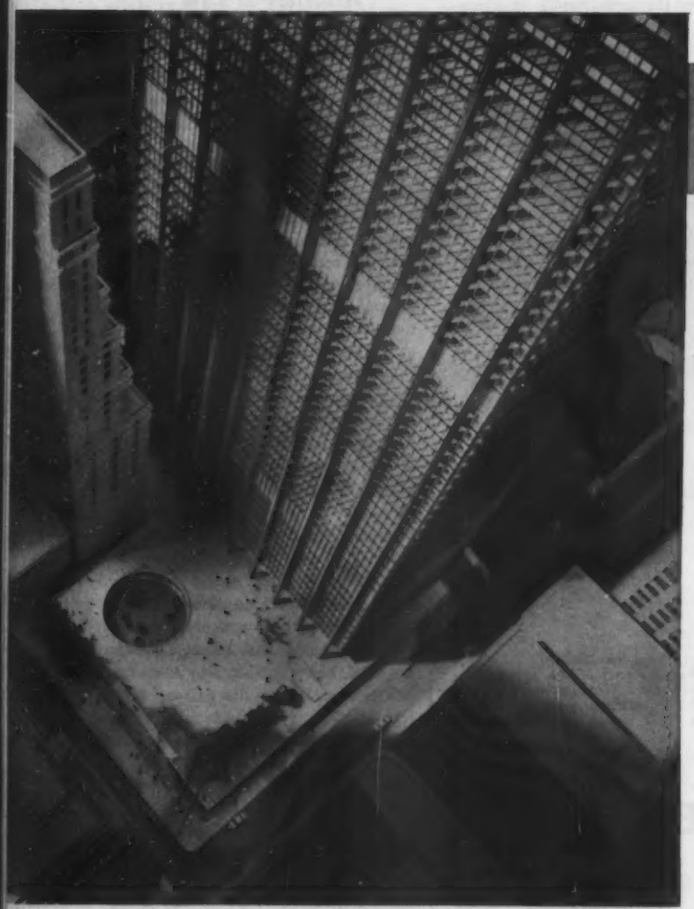
The commission had acted upon a theory advanced by a medical expert that to allow compensation on an assumption of permanent total disability would tend to confirm the workman's belief that he would remain in Divine disfavor and prevent physical recovery. In ordering a rehearing by the Commission, the Supreme Court reasoned that there was total, but not necessarily permanent, disability and that a favorable settlement of the worker's claim would tend to convince him that God had forgiven him and thereby end the psychosis from which he was suffering.

Priority rights against construction funds

THE PROBLEM: *A New York lien law was so worded as to make funds received by a subcontractor from the prime contractor, on a real estate improvement job, trust funds for the benefit of all materialmen. The law did not specify whether it applied only to improvement of real estate in New York. A New York contract under which a supplier furnished materials to a subcontractor covered improvement of land in Pennsylvania. The subcontractor received checks in New York as partial payment for work and materials. He endorsed them over to one of its suppliers but afterwards became bankrupt. Could the other materialmen who were prejudiced by this preferential payment require the preferred supplier to account for the funds received, under the New York statute?*

THE ANSWER: No. (Allied Thermal Corporation v. James Talcott, Inc.,

←For more facts, circle No. 302



Scale model of new Chase Manhattan Bank Building, now under construction in down-town Manhattan. Foundations for this structure will be set in solid rock, 85 feet below street level.

GYRO-FLO *in the news*

3300 cfm of Gyro-Flo Air Power Helps Prepare Excavation for New Skyscraper

In downtown Manhattan, New York City, there is in progress "the" most difficult foundation job in the world — The Chase Manhattan Bank Building Foundation. The sixty story edifice of steel and glass will be set on a foundation carried down to and into solid bed rock, at a depth of 85 feet below street level.

The foundation construction, the most important phase of the complete project, is progressing rapidly under the skilled management of The Foundation Company, George M. Brewster, and Joseph Miele Construction Co. with Lou Miller as project manager, Gene Fullam, General Superintendent.

SIDEWALK SUPERINTENDENTS

To the "sidewalk superintendents" who daily help oversee the job, Ingersoll-Rand Gyro-Flo compressors have been a familiar sight. When the job first started, there were five of them down in the big open pit (one 900 cfm and four 600 cfm units) supplying 3300 cubic feet of air per minute for the drilling operation. As the job rapidly progressed and the need for air decreased, three of the 600 cfm units were taken off the job and placed at another.

Not so conspicuous, but equally important, are the rock drills which operate deep below the surface. Line-hole drilling, four holes to the foot, is accomplished at a rapid pace by Ingersoll-Rand DB35 drifter drills with JHM Wagonjack mountings on 20-foot quarry bars.

WINNING COMBINATION

This combination — Gyro-Flo air power and I-R rock drills — has helped building contractors meet the tightest schedules on major jobs all over the world. Gyro-Flo rotary compressors, available in sizes from 85 cfm to 900 cfm, deliver a constant supply of 100 psi air with practically no attention or maintenance. Their on-the-job dependability has become the standard by which all others are judged. And their rugged all-weather construction keeps them on the go under the most severe atmospheric and climatic conditions.

For information on how Gyro-Flo air power can help you speed up construction and avoid costly delays, just call your nearest Ingersoll-Rand representative.

The 900-cfm Gyro-Flo portable compressor shown in the foreground heads a line-up that includes four 600 cfm units, only the tops of which can be seen.

Line-hole foundation drilling, four holes to the foot, is being done with this quarry-bar setup using Ingersoll-Rand DB35 drifter drills on JHM Wagonjack mountings.

Ingersoll-Rand

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AN UNBEATABLE COMBINATION... GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

144 N. E. 2d 66, decided by the New York Court of Appeals.) By a 5-to-2 vote, the court decided that the statute applied only to improvement of New York real estate. The opinion approved a similar conclusion reached by the Appellate Division of the New York Supreme Court (159 N. Y. Supp. 2d 115).

Contract required filling of grub holes

THE PROBLEM: *A contract involved clearing a large area to ground level preparatory to erection of a radio transmitting station. It was clear from the wording that the contractor was bound to fill holes left in grubbing the roadway and walk areas. The contract also read: "In foundation areas, all roots larger than 3 inches in diameter shall be removed to a depth of 18 inches below such foundations, and the excavation refilled with suitable material as specified elsewhere herein. In other areas, stumps, matted roots, and roots larger than 2 inches in diameter shall be removed to a depth of not less than 18 inches below the finished surface". Did the contract require refilling of holes left in the "other areas" where roots larger than two inches were grubbed?*

THE ANSWER: Yes. (Thompson v. Fidelity & Casualty Co., 238 Fed. 2d 357, decided by the United States Court of Appeals, Fourth Circuit.)

The opinion is interesting chiefly because it is to the effect that every clause of a contract is to be read in context with the agreement as an entirety and the purposes to be accomplished. It would be unreasonable in the circumstances to say that there was no intention to require refilling the holes in the "other areas" when the object of the contract was to complete ground leveling.

Ironworker was injured

THE PROBLEMS: *A subcontractor's ironworker, carrying a beam along the top of an uncompleted concrete wall, stepped upon loose brick which a masonry subcontractor's employee had left piled level with the top of the wall in a pocket constructed to accommodate beams to be installed. The ironworker fell and was seriously injured. (1) Were the general contractor and the masonry contractor liable to the injured man? (2) Was the general contractor entitled to be reimbursed by the masonry subcontractor for his part of the joint liability?*

THE ANSWERS: Yes. Yes. (Sodrman v. Stone Bar Associates Inc., 159 N. Y. Supp. 2d 50, decided by the New York Supreme Court, Appellate Division, Second Department.)

The masonry subcontractor was bound to foresee the presence of the ironworker and to use reasonable care to guard against such an accident. The bricks had been there 11 days. The general contractor was bound to keep the premises in reasonably safe condition and to make inspections as the work progressed and as prudence dictated. But the contractor's negligence was passive while that of the subcontractor was active.

For more facts, circle No. 303->

Use of prospective sub's figures in bidding

THE PROBLEM: *Plaintiff company specialized in underground installations. Defendant contractor was competing with other contractors for a public building job. Plaintiff furnished to some or all of the bidders figures at which it was willing to subcontract. Defendant, successful bidder, used plaintiff's figures but refused to award him a subcontract. Was defendant liable in damages?*

THE ANSWER: No. (Milone & Tucci, Inc. v. Bona Fide Builders, Inc., 301 Pac. 2d 759, decided by the Washington Supreme Court.)

The decision was influenced by these facts: plaintiff did not expect to be reimbursed for its expense, $210, in preparing its offer to defendant, except as it would profit through securing a subcontract. Defendant's low bid was not due to plaintiff's figures. On the contrary, the other bidders for the prime contract bid lower than defendant as to the work offered to be done by plaintiff.

The court noted a case where it had previously allowed a prospective subcontractor to collect damages from the successful bidder on a prime contract, when the latter had used the subcontractor's figures. But the firm had agreed, if it got the prime contract, to award the work to the subcontractor. (Western Asphalt Co. v. Valle, 25 Wash. 2d 428, 171 Pac. 2d 159.)

Cases from other states, in which mere use of a prospective subcontractor's figures by the successful bidders for prime contracts was declared not to render the latter liable, referred to by the Washington Court: R. J. Daum Const. Co. v. Child, 247 Pac. 2d 817, decided by the Utah Supreme Court, and Williams v. Favret, 161 Fed. 2d 822, decided by the U. S. Court of Appeals, Fifth Circuit.

"With P&H we saved buggying concrete 2 floors"

At the job-site of an 11-story Chicago hospital, operator Bob Michael was asked about the performance of this rugged P&H 50-ton capacity crawler crane. He said, "After the 7th floor, the boss figured on buggying concrete. We're already pouring on the 9th because this rig's got the speed and lifts higher. I like these big brakes and smooth hydraulic controls. I can 'feel' the load right in—spot quicker—even in 'blind' spots."

SAYS Bob Michael, operator of 50-ton P&H 855B-LC.

Other features Bob Michael likes about the "855" is the P&H planetary boom hoist which raises and lowers the boom under power. It gives him the ¼ inch he needs for real precision work. And with the P&H live roller circle, he can swing right along with the men as they keep their hands on the concrete bucket and pour.

For high and heavy lifting, no other machine in the 50-ton class can match the workable capacity, speed, stability and accuracy of the P&H 855B-LC with long crawlers. That's why when owners and operators get together they agree on P&H!

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin

Before the stone spreaders start laying the 7½-inch base, a Bros 10-ton pneumatic roller prepares the subgrade along the 9½ miles of Garden State Parkway extension.

Self-propelled spreaders lay base stone at high rate

Average of 3,000 tons of macadam base material placed daily by two spreaders for 7½-inch base course on parkway extension

An average of 3,000 tons of macadam base stone, placed during a 10-hour work day, is a high rate for any contractor to meet. Reid Contracting Co., Woodbridge, N. J., hit this rate consistently during construction of a 7½-inch base course. The job was for a 9½-mile extension of the Garden State Parkway that connects at the state line to a short feeder route leading to the New York Thruway. Working 10-hour days, the contractor had paving—including shoulders—essentially completed in 9½ weeks.

Spreaders work both lanes

The subgrade was compacted by two Bros 10-ton, self-propelled, pneumatic rollers, together with a Ferguson 25-ton roller. Two Blaw-Knox stone spreaders were moved in to place the two 12½-foot widths of base stone for each roadway. The 7½-inch-thick base was placed in two lifts, the first a 4-inch lift of 2½-inch stone, the top 3½-inch lift of 1½-inch stone.

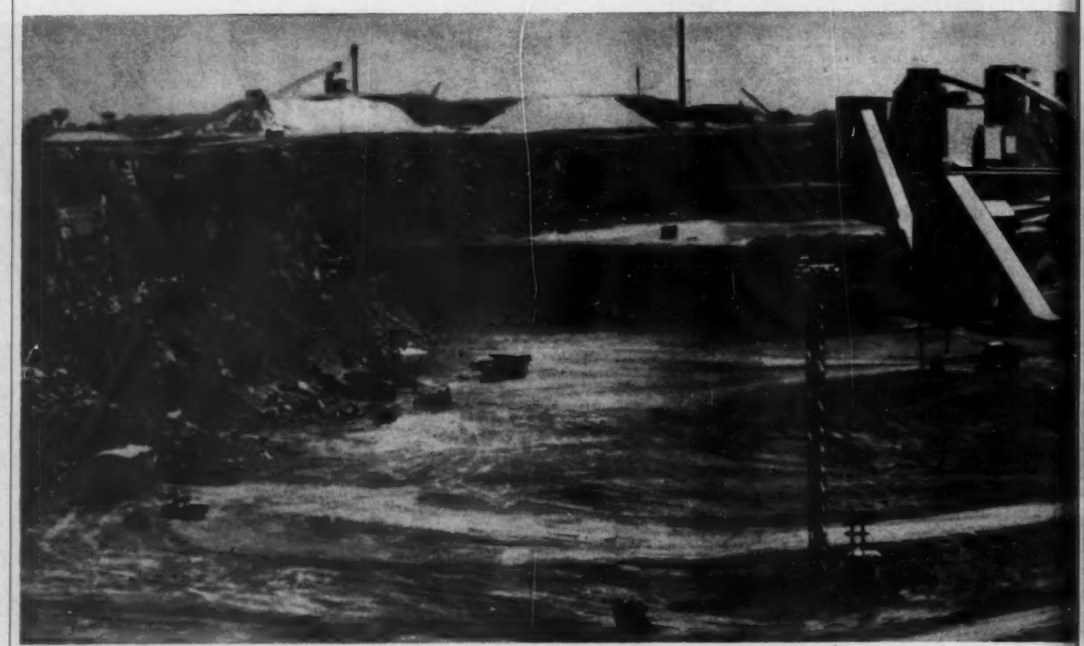
The spreaders, working in a staggered pattern, placed stone simultaneously for both lanes. An International Vibro-Tamper made a single pass over the 4-inch lift before two 10-ton, 3-wheel rollers—a Buffalo-Springfield and a Galion—and two 3-wheel tandem rollers applied final compaction. The 345,000 square yards of base stone, furnished by Samuel Braen Sons & Co., Wyckoff, N. J., was delivered to the Blaw-Knox spreaders in White 10-ton dump trucks.

Two Apsco wideners, one working on each shoulder, placed the more than 140,000 square yards, of 4½-inch-thick penetrated macadam that went into the 10-foot outside shoulders and the 3-foot inside shoulders.

Asphalt paving

The 345,000 square yards of asphaltic-concrete was placed in two lifts—a 1½-inch binder course and a 1-inch wearing surface—by two Barber-Greene finishers working side by side. These rigs kept a large fleet of batch trucks busy as they put down the binder and wearing courses in 12-foot widths for both roadways. In the best 10-hour day, both machines laid 2,000 tons of material. Texaco asphalt was exclusively used on this project.

Reid Contracting used two Buffalo-Springfield 3-wheel, 10-ton tandem



Moving 16,000 to 20,000 tons of

One of the biggest and most efficient stone-crushing plants on this continent is owned by The Highway Paving Company Limited of Montreal, which recently increased its capacity from over 400 tons per hour to over 1600 tons per hour.

Almost all of this operation is automatic. However, quadrupling production involved moving rock from quarry face to crusher in sufficient quantity to assure Highway Paving's booming operations of a continuous supply of crushed stone.

Seven Macks were given the job. Working under six-yard electric shovels, they shuttle from shovel to crusher, each making 10 trips an hour; the seven trucks average over 16,000 tons per day. The shovels really have to move to keep up with the hustling Macks, which are on the go 10 hours a day.

Highway Paving knows that its production of crushed stone is dependent on equipment that must maintain "the pace that kills", day after week after month, without crippling breakdowns. Their Macks

Mack being loaded by one of the six-yard electric shovels. The Macks take a brutal beating from the seven-ton impact of broken limestone dropped with each shovel pass . . . but come right back for more.

Trucks feed both Blaw-Knox spreaders with 2½-inch stone for the bottom 4-inch lift. The top lift, of 1½-inch stone, is 3½ inches in depth.

The 1½-inch binder course placed by a Barber-Greene, the finisher starts laying the 1-inch surface, which is immediately compacted by a Galion 10-ton tandem roller.

rock per 10 hour day with 7 trucks

have proved that they are worthy of this dependence. In fact, no other make of dump vehicle is used in this quarry.

Macks have everything it takes for dependable, profitable quarry, mine or construction hauling. Your nearest Mack representative will be glad to give you the names of Mack users in your area who are racking up new production records, with minimum down time and top economy. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

5511

Dumping rock into Highway Paving's huge crusher which is so located that trucks can dump into it from both sides. Number of loads emptied into crusher are counted electronically, and tonnage crushed is determined by belt weighing equipment.

rollers and two Galion two-wheel tandems to handle the compaction of the two lifts.

Personnel

A. B. Reid was the project manager; Manuel Teixera, general superintendent; and Jack Davies, assistant project manager, for Reid Contracting. Each of these men kept in constant touch with the field superintendents and office with General Electric mobile radios. Fourteen mobile sets and one base station, operating on 43.18 mcs, were in use on the $7 million project.

D. Louis Tonti is the executive director for the New Jersey Highway Authority, the agency chartered to construct and operate the Garden State Parkway. C. J. Teegan is the chief engineer of the Authority.

H. A. Thomas was the project engineer for Fay, Spofford & Thorndike, Inc., Boston, Mass., the consulting engineering firm supervising construction of the stretch. THE END

P&H promotes five

Five men have been promoted in the sales force of the Construction and Mining Division, Harnischfeger Corp., Milwaukee, Wis.

F. J. Hirner is sales manager, electric excavators; he will direct marketing of all P&H electric shovels from 3½ through 8-cubic-yards capacity. Succeeding Hirner as district manager of Harnischfeger's Chicago office is W. N. Ryan, former excavator salesman in the Chicago territory; aiding Hirner as assistant sales manager is G. T. Raubach. R. B. Maxson has been promoted from excavator salesman to district manager at Buffalo, N. Y., and C. R. Morgan, Jr., is sales manager for soil stabilizers and Sierra loaders.

Cyanamid appoints two managers

J. G. Affleck and R. W. McCullough are manager and sales manager, respectively, for the rubber chemicals department of the Organic Chemicals Division, American Cyanamid Co.

Affleck joined the firm in 1949 and has served as manager of the firm's new product development department since 1955.

McCullough, with the company since 1950, was formerly manager of technical services for the rubber chemicals department.

←For more facts, circle No. 304

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LIGHTWEIGHT ONE-MAN OPERATION!

SMALLEST VIBRATOR HEADS MADE!

¾" - 1" - 1¼" - 1⅜"

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For use in construction work, concrete product manufacturing, and other applications where spaces are 1½" or less. Available with speed control where necessary.

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Get into the profitable prestressed concrete business now with accurate, economical Form-Crete steel casting forms. A newly revised catalog is yours for the asking. Write for your copy today.

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Stephen W. Benedict, president of the Master Builders Co., Division of American-Marietta Co.

Master Builders elects S. Benedict president

Stephen W. Benedict has been elected president of The Master Builders Co., Division of American-Marietta Co., Cleveland, Ohio, and vice chairman of the board of directors of Master Builders Co., Ltd., of Canada. He succeeds Edwin L. McFalls, who retired as president but is remaining as consultant.

Other company advancements were: William B. Phillips to executive vice president; Robert G. Ahrens, vice president and comptroller; and Lane Knight, president of the Master Builders Co., Ltd., of Canada.

Worthington Corp. elects

Worthington Corp., Harrison, N. J., has elected Adm. Arthur W. Radford to the board of directors. Adm. Radford, recently retired from the Navy after 45 years of service, was former chairman of the Joint Chiefs of Staff.

Chrysler names manager

M. J. Yost has been named sales manager for the Industrial Engine Division, Chrysler Corp., Detroit, Mich. He was formerly manager of the West Coast office of the Marine and Industrial Engine Division at Los Angeles.

Robert G. Allen, executive vice president of Bucyrus-Erie Co.

B-E elects R. G. Allen executive vice president

Robert G. Allen has been elected executive vice president of the Bucyrus-Erie Co., South Milwaukee, Wis. He joined the company last year as vice president, and was appointed assistant to the president and, shortly afterward, was placed in charge of all manufacturing operations.

The company appointed Lewis C. Black assistant general sales manager in charge of sales of large machines and blast-hole drills. He was formerly sales manager of large machines.

J. V. Wright, (left) president, and T. K. Dorsey, executive vice president, of Dorsey Trailers, Inc.

Dorsey Trailers elects J. Wright, and T. Dorsey

Dorsey Trailers, Inc., Elba, Ala., has elected J. V. Wright president, and T. K. Dorsey executive vice president. Horton Pick was elected vice president in charge of sales.

Wright joined Dorsey in 1912, a year after its founding. He has held both sales and management positions.

T. K. Dorsey, son of the co-founder, Henry Dorsey, has worked in produc-

"So instead of buying a six wheeler to carry six hundred cfm, we bought a ton-and-a-half, loaded one D-901 on it and towed the other."

Less than 5000# net operating weight

D-901-R
320 cfm
9'10" overall with drawbar

That's a primary economy of I. & E. Diesel-driven, air-cooled compressors, weight. Where else can you get so much air for so little dead weight? On two wheels too.

Sole Agents

AIR COMPRESSORS, INC.

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tion, purchasing, service, and sales. In 1956, he was made vice president in charge of distributor sales.

Ralph E. Keidel, advertising and sales promotion manager for the Euclid Division, General Motors, is general chairman of CEA.

CEA elects Keidel general chairman

Ralph E. Keidel, manager of advertising and sales promotion for the Euclid Division of General Motors Corp., Cleveland, Ohio, has been elected general chairman of Construction Equipment Advertisers. He succeeds M. B. Jaeger of Bucyrus-Erie Co., Milwaukee, Wis.

Other CEA officers elected at the same time are R. Koehler of Westinghouse Air Brake Co., Pittsburgh, Pa., program chairman; Madison Crawford of The Frank G. Hough Co., Libertyville, Ill., secretary; and Don Orlaska of Andrews Agency in Milwaukee, treasurer.

C. A. McTaggart, vice president of Armco Drainage & Metal Products, Inc.

Armco elects McTaggart

C. A. McTaggart, northwestern division manager for Armco Drainage & Metal Products, Inc., Middletown, Ohio, has been elected a vice president of the company.

His service with Armco dates from 1926 when he was associated with the Armco Culvert Manufacturer's Association. Later, he was assistant manager of the Sioux Falls Metal Culvert Co., which became part of Armco.

McTaggart served as the firm's state and division sales manager, and has been manager of the northwestern division since 1956.

E. George Hartmann, vice president of sales for John A. Roebling's Sons Corp.

John A. Roebling's Sons elects vice president

E. George Hartmann has been elected vice president of sales of John A. Roebling's Sons Corp., Trenton, N. J., succeeding Ernest C. Low who retired. Prior to his appointment, Hartmann was general product manager of the firm's Wire & Cold Rolled Products Division.

W. C. Palmer replaces Hartmann as general product manager; and F. T. Updike moves up from chief engineer to sales manager of the Wire & Cold Rolled Products Division.

Standard Steel appoints

W. Spence Flinn has joined Standard Steel Corp., Los Angeles, Calif., as Southeastern district representative for asphalt plants and accessories. From headquarters at Chattanooga, Tenn., he will cover Arkansas, Alabama, North and South Carolina, Kentucky, Maryland, Louisiana, Georgia, Virginia, Mississippi, Florida, Tennessee, West Virginia, and the District of Columbia.

Rea Anderson has been made the firm's chief metallurgist and head of the quality control department.

A-C appoints manager

The Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed J. D. Harmison sales manager of material handling for the Buda Division. Harmison has been with the firm since 1939, working up to the post of tractor sales manager of the Farm Equipment Division.

Chain Belt elects new executive vice president

The Chain Belt Co., Milwaukee, Wis., has elected O. W. Carpenter executive vice president, and W. C. Messinger vice president of the Construction Machinery Section. Carpenter, formerly vice president of construction machinery and finance, is now responsible for current operations of the company.

O. W. Carpenter and W. C. Messinger, executive vice president, and vice-president of the Construction Machinery Section, respectively, for Chain Belt Co.

Messinger is now responsible for the General Road Machines Division, Niles and Newton Falls, Ohio; the Burmeister Division, Milwaukee, Wis.; and the company's California plant operation.

"One Man" Field Tool Machines any A-C Profile

Cuts lathe-smooth joints with machine shop precision faster, and right on the job, for:

- RING-TITE COUPLINGS
- SIMPLEX COUPLINGS
- ROTO-SPLIT FLANGES
- POURED FLANGE ASSEMBLY
- TAPERED COUPLINGS
- MAKING CLOSURES
- END FACING

Save on installation time, salvage broken and short pieces, eliminate machine shop, lathe, and hauling costs! This one-man tool accurately machines closures up to 9" couplings, on the job! Approved by leading A-C pipe manufacturers. Ask for it, and Spring Load A-C Pipe Cutters at your suppliers, or write.

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SPRING LOAD A-C MACHINING AND TAPERING TOOL

Sizes for 4"-8" and 10"-20" pipe. For holding 4"-20" A-C pipe, use Spring Load V-20 vise.

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Weldynamics

ARC WELDING AT WORK CUTTING COSTS

Abrasoweld cuts maintenance costs 33% on dragline buckets

Use of dragline demands resistance to both abrasion and impact. The Weldynamic analysis of the job shows Abrasoweld for building up bucket teeth and lips to be the electrode which gives the most economical overall maintenance for 4 out of 5 dragline operations. Used on buckets operating in rocky soil, Abrasoweld wears 3 times longer than other surfaces . . . yet costs less in most cases.

Lincoln men, trained in Weldynamics, will help you choose the right hardsurfacing electrode to solve your wear problems. They stand ready to advise on technique and procedures to guarantee hardsurfacing success.

The World's Largest Manufacturer of Arc Welding Equipment

LINCOLN

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THE LINCOLN ELECTRIC COMPANY, DEPT. 5320, CLEVELAND 17, OHIO

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Distributor deluxe

In the usual order, at the opening of the new quarters, are Chester T. Mitchell, vice president and general manager of Howell Tractor; Gordon Nelson, project manager for contractor Arthur Nelson Co.; James Cranson, Midwestern Territory representative for I-H; David W. Howell, vice president and general sales manager of Howell; and Thomas Flood, vice president in charge of sales for The Frank G. Hough Co.

Howell Tractor to open sales, service building

Howell Tractor & Equipment Co., Chicago, Ill., has started construction on a 25,560-square-foot sales and service building in Centex Industrial Park, northwest of Chicago. The building will be located on four acres on Pratt Avenue, east of Route 83.

When the building is completed, the earthmoving and grading equipment distributor will make its headquarters there.

Howell, a distributor for such firms as the International Harvester Construction Equipment Division, Frank G. Hough, Galion Iron Works, Seaman-Gunnison, and Drott, plans to move into its new quarters in the spring.

CRASHING THE PROFIT BARRIER

THE HOBBS SCHONROCK CABLE DUMP TRAILER

Costly down time, snail-paced dumping, wear and tear on your truck, idle equipment, idle workers. All-important things that can stack up a barrier in front of your profit.
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NEW STRENGTH IN FRAME. Redesigned with crossmembers, outriggers and dual centerbeams set for stronger connection between all component parts. The box has more side posts for added strength. The subframe has increased strength and allows more flex in the center beam to handle even the strongest shock loads.

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SALES AND SERVICE IN 38 STATES AND MAJOR CITIES

For more facts, use coupon, or Request Card at page 18 and circle No. 310

B-L-H Corp. appoints S. Carolina distributor

Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, Ohio, has appointed the Jeff Hunt Machinery Co., 1220 Huger St., Columbia, S. C., distributor in that state for Lima shovels, cranes, draglines and pull-shovels with ½ to 6-cubic-yard capacity, and the Lima Roadpacker vibratory compactor.

Quaker appoints

The West Central Sales Division, Harbor Steel & Supply Corp., Muskegon Heights, is the western Michigan dealer for the Quaker Rubber Division, H. K. Porter Co., Philadelphia, Pa. The dealer carries a complete line of industrial rubber products and rubber hose.

Yale & Towne appoints

The Yale & Towne Mfg. Co., Batavia, N. Y., has appointed two distributors to carry the Trojan line of

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CREWS HAVE READY POWER FOR ANY JOB... ANYWHERE!

You save time . . . You speed work . . . because with Katolight Portable Power Plants, crews have "plug-in" electricity instantly available to operate all types of tools, equipment, lights, right on the job, regardless of location or conditions.

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BOX 891-B MANKATO, MINNESOTA

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tractor shovels. McNall Machinery & Supply Corp., 600 D Ave., N. W., Cedar Rapids, Iowa, will cover that state; and Straits Engineering Co., Seymour and Easterday, Sault Ste. Marie, Mich., will serve the entire upper Michigan peninsula.

The firm also appointed O. B. Avery Co., Inc., 1325 Macklind Ave., St. Louis, Mo., a distributor for their Trojan line of tractor shovels for the eastern half of Missouri, and the counties in southern Illinois.

Anthony Co. holds annual sales conference

Anthony Co., Streator, Ill., manufacturer of dump truck bodies and trailers, lift gates, and truck cranes, held its second annual international sales conference early this month. More than 150 of the firm's distributors and salesmen attended.

G. Herbert True, marketing professor at the University of Notre Dame, was the keynote speaker.

L. A. Young appoints

The Daybrook Hydraulic Division of L. A. Young Spring & Wire Corp., Bowling Green, Ohio, has appointed Erlinder Equipment Corp., 12221 S. Indiana Ave., Chicago, Ill., a distributor. Erlinder will carry Daybrook's line of dump bodies, hydraulic hoists, Power Gates, Power Loaders, and Power Packers.

LeTourneau appoints

Robert A. Bever has been appointed export sales representative for R. G. LeTourneau, Inc., Longview, Texas. Prior to joining the company, Bever conducted a survey of the sales potential in the Scandinavian countries, Europe, South Africa, and the Belgian Congo as part of his job with Caterpillar Tractor Co.

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For more facts, circle No. 312

Almost 1,300 feet of steel cable and mesh now span the Colorado River at the Glen Canyon Dam site. The suspension footbridge, erected in 60 days, is being used by employees on the project.

Suspension footbridge completed at Glen Canyon

A 1,280-foot suspension-type footbridge now spans the Colorado River at the Glen Canyon Dam site. The steel footbridge, being used as a walkway for project employees on the Glen Canyon Dam project, provides ready access to both sides of the Colorado River.

The steel-mesh deck is supported by six main suspension cables, with eight floor cables forming the base of the deck. Two wind cables, anchored in the canyon wall, are tied to the bridge deck to prevent swaying.

The footbridge is essentially built of cables, with structural steel used only in the A-frames on each side of the river, and for lateral braces under the mesh deck. The bridge was erected in 60 days by Kiewit-Judson Pacific Murphy Co., under contract to Merritt-Chapman & Scott Corp.

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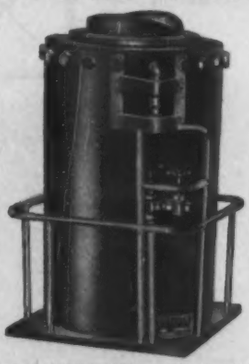

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here's real news . . .

NEW FLASHER SAFETY LIGHT

DEPENDA-PAK TIMER

Dependa-Pak electro-mechanical flash timer has quick-alignment plug positioning marker on socket for fast, fool-proof connection of match-marked wiring plug.

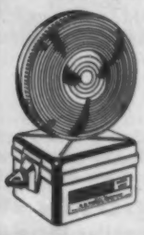
For the best in money-saving hazard warning protection and *exclusive guaranteed dependability*, choose Fageol Flasher Safety Lights!

Powered by a long-life 8-cell battery, Fageol Flasher Safety Lights provide over 100 brilliant flashes per minute, visible as far as 2 miles . . . operate continuously up to 90 days between battery changes . . . feature heavy-duty, shock-resistant construction . . . discourage vandals . . . flash without fail, even in driving rain and high winds.

Best of all, the new Dependa-Pak timer is fully guaranteed against failure for an entire year, in normal service. Its rugged electro-mechanical flash timing and power boosting mechanism has been performance-proved in millions of hours of service in similar applications. Dependa-Paks require no field service or adjustment!

Your nearby distributor will be glad to show you how Flasher Safety Lights and matching Barricades can give you dependable hazard warning protection—at much lower cost than out-dated methods. Call him today! R. D. Fageol Company, Kent, Ohio.

AA-5474



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UNI-DIRECTIONAL FLASHER LIGHT

COMPACT ALL-STEEL FOLDING BARRICADE

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Surveying Washington

by GEORGE RIVEIRE, JR.

A more expensive Road Program than had been anticipated was one of the first things lawmakers faced upon their return to Washington for the second session of this Congress.

Secretary of Commerce Sinclair Weeks told the Senate Subcommittee on Roads that, on the basis of new state estimates, the cost of building the interstate highway system from start to finish had been revised upward 37 per cent. The new appraisal brings the total price tag on completing the superhighway network to $37.6 billion, $10 billion more than originally estimated.

Of the $37.6 billion estimated to be needed, some $39.95 billion would be in federal-aid funds and $3.67 billion in matching state funds.

He emphasized that this first revised estimate of cost comes early in the program and may not accurately reflect the actual final cost. A better line on actual cost, he said, will be provided by future estimates, made when program construction has moved nearer to completion.

Under law, future revised estimates must be submitted to Congress in January of 1962, 1966, 1967, and 1968. The first revised appraisal was submitted as the basis for apportioning interstate funds for the fiscal years ending June 30 of 1960, 1961, and 1962.

Sen. Albert Gore (D., Tenn.), chairman of the roads subcommittee, said the new cost estimates will be "carefully reviewed and considered" before a resolution of approval is passed.

Four causes for the increases on the Interstate System were presented in a report by Federal Highway Administrator Bertram Tallamy. They are:

1. The national traffic forecasts for 1975, made subsequent to passage of the Highway Act of 1956, are 15 per cent higher than previous forecasts, creating a need for more traffic lanes and other facilities. On the Interstate System the added facilities that are necessary run around five per cent.

2. An estimated 63 per cent more highway grade separations, interchanges, and frontage roads than were originally anticipated will be needed to serve local needs. This will raise the total work load by around 15 per cent.

3. Miscellaneous items such as utility adjustments, lights, signs, and other incidentals will add another 3 per cent.

4. Interstate System construction costs rose 12 per cent between mid-1954 and the last half of 1956. (The first revised cost report is based on 1956 price levels.)

The adjusted price tag of $37.6 billion that Weeks presented actually covers only the cost of 38,548 miles of the Interstate System, which eventually is supposed to stretch to 41,000 miles. The states reduced their cumulative mileage from 40,000 to 38,548 by selecting more direct locations for routes already designated. The Commerce Department subsequently announced additional mileage of interstate routes expected to be added to the system to replace this saving, but

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none of the cost of this mileage was included in the estimate. The extra thousand miles authorized as an addition to the original 40,000-mile system were also excluded.

On an over-all basis, Weeks told the senators, the highway program, including the primary, secondary, and urban projects, is on schedule.

Pressed by Sen. Gore, who does not think everything is rolling with maximum smoothness, the Secretary admitted that some states are lagging. He mentioned eight states which he said were behind schedule in obligating their 1957 funds: South Carolina, Montana, Maine, South Dakota, Idaho, Indiana, Delaware and West Virginia.

Asked about this, administrator Tallamy said all these states have assured him they will advance the pace of their work this year and catch up.

Both Tallamy and Weeks pointed out that 72 per cent of 1958 funds have been obligated by the states on the average. That, they thought, was very good.

Weeks testified in favor of some federal legislation to encourage state control of outdoor advertising along the system, and to prevent the placement of utility facilities within interstate right-of-ways. He also opposed the use of federal funds in paying utilities for the relocation of facilities where no vested property right is taken and the utility is not entitled to compensation under constitutional provisions.

The Commerce chief noted that he had previously gone on record against adding to the authorized mileage of the Interstate System now and indicated that his position hasn't changed.

"The decision to limit the Interstate System to 41,000 miles was made after considerable study and investigation," Weeks said, "and it is my belief that any enlargment of the system at the present time would be premature.

"In my opinion, any increase in the authorized mileage should be deferred until we can determine with reasonable certainty the revenues which will accrue to the Highway Trust Fund, the expenditures that will be required to complete the 41,000-mile system, and the need for adding to the system in specific areas."

Last year Sen. Francis Case (R., S. D.) sponsored a proposal to boost the system to 48,000 miles, with time for completion of the project to be stretched seven more years. The cost of the extra 7,000 miles was pegged at $15.4 billion in federal funds.

Case's proposal was tabled by the roads subcommittee, and it would be surprising if the measure does not stay pigeonholed this session.

Another issue is whether or not reimbursement should be made to the states for highways—toll or free—which are incorporated into the interstate network. Eligible for possible reimbursement would be those highways that were begun or completed between August 1947 and June 1957.

Decision on reimbursement is up to Congress. As a guide, the Bureau of Public Roads submitted a report indicating that on a national basis, 10,859 miles of these highways are eligible for reimbursement. This is 28 per cent of the 38,548 miles of detailed locations on the Interstate System approved as of last September.

The eligible mileage, according to the report, consists of 8,909 miles of free roads in 47 states and 1,950 miles of toll roads in 26 states.

Total cost of the highways eligible for reimbursement consideration amounts to $6.09 billion—$3.5 billion for free routes and $2.59 for toll.

The computed depreciation on this mileage is only $174 million.

Complete coverage of the American Road Builders' Association and the Associated Equipment Distributors conventions will be carried in the March issue of CONTRACTORS AND ENGINEERS.

HRB bulletin discusses bituminous mixtures

Bulletin 160, "Bituminous Paving Mixtures", is available from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The bulletin contains two papers. One on state practices in the use of bituminous concrete has information supplied by 50 highway agencies concerning standard specifications requirements and general practices.

The second paper investigates the use of foamed binders in bituminous paving mixtures and in bituminous soil stabilization. It also reports on the feasibility of producing a foam of bituminous binder in several forms.

The bulletin is priced at $2.40.

Westinghouse Air Brake appoints Birchard

The Westinghouse Air Brake Co., Pittsburgh, Pa., has appointed its vice president, Paul I. Birchard, to the president's staff on special assignment.

Birchard assists in the coordination and integration of the company's various divisions and subsidiaries.

For more facts, circle No. 319→

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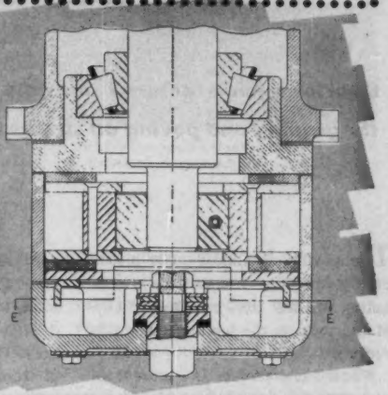
Holds Like a Bear Trap . . .



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The PRIMER gives excellent rust-resistance, is fast drying (30-40 min.) and forms an excellent surface for applying the enamel. It is abrasion-resistant. Can also be used on marine and floating equipment.

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THEY ARE ECONOMICAL — SAVE TIME, LABOR & MATERIALS

Some exclusive franchises still available.

New 2-color brochure available on request.

KOTAL Company
360 SPRINGFIELD AVE. SUMMIT, N. J.

Big improvement program paves thousand blocks of new street

Four local joint-venture firms take $5 million contract for grading and paving all streets in improvement district

A Gradall proves itself versatile for one of the first jobs in the improvement program—trenching for a new curb and gutter. The machine maneuvered easily under trees and wires and around obstructions.

The paving of almost 1,000 blocks of city streets is an ambitious undertaking for any city, but Great Falls, Mont., took on the job and made it a success.

Under a city contract for more than $4 million, together with four State Highway Commission contracts totaling more than another million, a substantial area of the city's street system was reconstructed. This spring, it is proposed to let smaller paving contracts for special improvement districts.

Setting an example for many cities with street systems that are below par, this Montana community of some 60,000 set up an improvement district covering about a third of its area. The consulting engineering firm of Harold Hoskins & Associates, Lincoln, Nebr., and Greeley, Colo., was engaged to prepare plans and supervise the work, and a contract was awarded for the renovation of all streets in the district. Assessments against the property will cover the cost of the work.

A group of local contractors banded together in a joint venture to make the successful bid of $4,186,721.60 for the project. At the same time, the Montana State Highway Commission developed four projects which were also taken by the joint venture on bids totaling more than a million dollars. The joint venture, called City Constructors, includes S. Birch, Inc., S. Birch & Sons Construction Co., McLaughlin, Inc., and Nilson-Smith Construction Co., all of Great Falls.

Starting with the repair or replacement of deteriorated underground utilities, the program provided a complete reconstruction of most of the streets. A few existing pavements were simply given a bituminous overlay.

New construction ordinarily started with new curb and gutter. Streets were then regraded to make room for new subbase, base, and the asphaltic-concrete surfacing. Base and subbase ranged from about 9½ to 13 inches in depth, depending on the underlying soil and the type of anticipated traffic. The asphaltic-concrete surfacing, applied in one or two courses, ranged from 1½ to 3 inches in thickness.

Residential streets were usually 35

NEW!

Now equipped with a new and larger Onan 12.9 hp engine, the new Miller AEA-200-L produces a full 225 amperes of continuous rated, high cycle welding current or, 5 KW of 110/220 ac power for operation of power tools, lights, milking machines, etc., or, 1 KW of dc power.

Contractors, job weldors, farmers and many industries have shown a continuing high regard for the AEA's weatherproof ruggedness, easy portability and instant changeover versatility from ac welder to power plant to pipe thawer.

Readi-pull starter, rubber tire running gear and road trailer available as optional equipment.

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PRIME-MOVER M15A FOR BUILDING CONSTRUCTION Places 12 to 17 cu. yds. of concrete per hour on school, hospital and commercial projects — *without* extensive preparations for its use. Runs on same type of ramps, hoists and runways as hand carts. Available with flatbed, or 10 cu. ft. bucket.

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Hauls ⅔ yard or 1-½ tons. Unloads transit mixers fast. Spots concrete right where it's needed on plant, warehouse, pier and bridge construction. Hydraulic Torque Converter Drive frees the operator from shifting, clutching and wasted effort. Rugged, dependable. Bucket and flat bed.

FOR COMPLETE DETAILS WRITE TO PRIME-MOVER CO., MUSCATINE, IOWA

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Street regrading, to get the grade low enough to make room for new base and surfacing, is handled by a DW10. Here the scraper is being push-loaded by an Allis-Chalmers HD-21 tractor.

A Ford truck with Gar Wood 10-yard dump body picks up a load of sand subbase. Pushed to a trap by a tractor-dozer, the material is carried by Kolman conveyor to a grizzly.

feet wide, from back to back of curbs, while the arterial and business streets were as much as 51 feet wide. The over-all width of the standard curb-and-gutter section was 21 inches.

The complete job required the excavation of 570,000 cubic yards of dirt, the placing of 360,000 linear feet of concrete curb and gutter, 160,000 cubic yards of sand subbase, 370,000 tons of rock base, and 220,000 tons of asphaltic-concrete surfacing. The project was started in July, 1956, but most of the first season was used for utility and other preliminary work. The entire project was completed near the end of last year.

Contractors divide work

In order for the grading, base, and other preparatory work to be handled, the improvement district was divided into three areas. The contractors took subcontracts for all but the paving work in each area. The Birch companies handled one section and the other two joint venturers each took one of the other sections. City Constructors did all of the paving.

Although each contractor used its own equipment and techniques, the operations were relatively similar. One of the first operations in all cases was the removal of existing pieces of curb, sidewalk, and other structures that were to be replaced. The contractors used tractor shovels on some of this work, but found the versatile Gradall to be one of the most satisfactory machines. It worked under trees and wires and in places where other shovels had difficulty. In addition to doing removal work, these machines excavated for the new curb and gutter.

Subcontractors specializing in curb-and-gutter and sidewalk jobs did most of this type of work. The standard combined curb and gutter was built without face forms by special machines such as Newaygo Curb Machine and the Dotmar curb-and-gut-

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Builder is Essick Manufacturing Co., Los Angeles, Calif.

WISCONSIN-Powered equipment

Manufactured by the Galion Iron Works & Mfg. Co., Galion, Ohio.

Quad City Equipment Co., Rock Island, Ill., builds it.

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AIR COOLING, requiring the least amount of attention in any weather, sub-zero to 140°F. . . . no water to boil away, no freeze ups.

HEAVY-DUTY DESIGN AND CONSTRUCTION, providing rugged resistance to hardest shocks in toughest going.

BASIC HIGH TORQUE, supplying load-holding lugging power that hangs on through shock loads. Gets the job done without delay.

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AMCO Brushmaster wheel-type two-way plow

Proven by contractors to be FAST-ECONOMICAL-PROFITABLE!

LAND CLEARINGS . . . does primary breaking, chops weeds, brush and sod. Softens soil and adds humus to the ground for moisture content.

CUT AND FILL WORK . . . one of the most important steps in any construction job and a key tool to do it better. AMCO Harrows break soil into fine bits which allows pan equipment to fill quickly and completely. Especially effective over other machinery in breaking hard pan soil. Breaks up top soils in material pits, too.

BEATS PLOWING . . . shallow soil disking (aided by wheels) does not bring up subsoil.

LANDSCAPING OPERATION . . . most effective in erosion prevention. Highway center strips, embankments, ground around building projects and drainage works are disked prior to and after planting. Turns hay and straw into the ground to prevent soil erosion.

STABILIZING SOIL . . . blends in necessary water and humus —cuts impervious soils to accept moisture.

AERATION OF SOIL . . . either mixes in additional dry soil or lifts wet soil to dry before compacting.

SCRATCHING A COMPACTED SURFACE . . . to key in new lift, especially after a hard rain.

EXCELLENT FOR MIXING BASE materials and stratas for a homogenous fill.

FINE FOR MIXING MATERIALS AND AGGREGATES in macadam type road construction.

TYPICAL AMCO FEATURES

- Fafnir factory sealed ball bearings — no greasing ever.
- First line dual Goodyear tires for transportation and flotation over soft spots.
- Easy adjustability to insure proper mixing and cutting.
- Available in 9', 11', and 13' sizes.
- Rugged, tough worker — ready to go and work anywhere you can put a tractor.

Write, Wire or Call for More Information and Prices

ALEXANDER MANUFACTURING COMPANY

P.O. BOX 407 - PHONE SY 8-4791 - PICAYUNE, MISSISSIPPI

For more facts, use Request Card at page 18 and circle No. 323

A Ford truck dumps base stone on a street. In residential areas like this, the material was placed in a single 5-inch course. Work was done on alternate streets so that people could always drive to within a block of their homes.

A Caterpillar No. 12 motor grader spreads and finishes both base and subbase, while a Tampo self-propelled 9-wheel roller handles compaction. Both machines are working at an intersection.

(Continued from preceding page)

ter paving machine.

Small rubber-tire scrapers, like the Caterpillar DW10 and DW15, were the most popular machines for regrading the streets. These were push-loaded by crawler tractors to cut existing streets down to a new subgrade. The residential streets were cut down to 12 inches below gutter grade, while the arterial streets were cut 16 inches below the gutter.

The excavated material was hauled to disposal areas, but practically all of it was used to good advantage. Broken concrete was placed along the river bank for protective riprap. Earth and other good fill was used to build up low areas in parks, school grounds, and other public places.

In a few areas, the subgrade material uncovered during excavation was found to be unsuitable and the excavation was carried deeper. These areas were reinforced with rough sandstone fill that was hauled in by a DW15. This rig was loaded with uncrushed material at the quarry by a 977 Traxcavator.

The contractors used a wide assortment of equipment to compact the subgrade to 95 per cent Proctor. Among the most satisfactory machines were the Hyster grid roller, sheepsfoot rollers, and the Buffalo-Springfield K-45 Kompactor. Pneumatic-tire rollers were also used.

Subbase and base

Sand subbase material was produced in a pit at the edge of the city and trucked to the streets in a fleet of Ford 10-yard trucks. At the pit, a Caterpillar D8 tractor-dozer pushed the sand up to a trap where a Kol-

A Ferguson self-propelled rubber-tire roller, used without ballast to give a weight of about twelve tons on the 11 tires, compacts the newly laid pavement.

INTERNATIONAL **all-wheel-drive models** cover the range from 7,000 lbs. GVW to 43,000 lbs. GVW in conventional and cab-forward design. There is one practically custom-built in the world's most complete truck line for every hauling job. Widest choice of load-moving and load-carrying components to keep operating and maintenance costs lowest.

Here's a unique all-purpose vehicle—the new INTERNATIONAL Travelall® with all-wheel-drive. Has half again more load space than any other "wagon." Truck-built to take off-highway punishment with 2000-pound-plus loads. Or use it as a full personnel vehicle with plenty of room for eight men. Also available with conventional drive.

INTERNATIONAL TRUCKS

Material for the base course, delivered by Euclid end-dump, goes to an apron feeder supplying the Universal 46×50 impact breaker. Finer sizes are scalped ahead of the impact breaker and fed to the secondary feed conveyor.

At the secondary unit, two 4×8-foot double-deck screens separate the sizes; oversize goes to a 54-inch roll crusher. Material leaving this crusher returns to the main feed belt. A loading conveyor brings finished material to the trucks.

man reciprocating plate feeder fed it onto a Kolman 30-inch×40-foot belt conveyor powered by an International U164 engine. A grizzly at the top of the conveyor separated sticks, stones, and other debris from the sand, which fell through into the trucks. A 10-yard box was filled in less than two minutes.

The sand was dumped in piles on the street, shaped into a windrow by a motor grader, and watered. The motor grader then laid the subbase to a predetermined depth, ranging from 3 to 4.5 inches, and shaped it to the crown of the road. Rolling with rubber-tire rollers—such as the self-propelled Ferguson 11-wheel 12-ton roller and the Tampo 9-wheel self-propelled rollers—proved most satisfactory for compacting this material. However, each of the area spreads had at least one rubber-tire roller, one sheepsfoot roller, one grid roller, and a tandem steel-wheel roller, and these were used as conditions dictated.

Preparation of the crushed-sand-rock base-course material was more complicated than subbase production. The rock, obtained from a commercial quarry operation near the edge of the city, was drilled, blasted, and loaded into four Euclid end-dumps for the haul to the crushing plant.

Rock dumped by the Euclids onto a large apron feeder was carried to a 4×12-foot scalping screen. Oversize retained on the screen was fed by gravity into a Universal 4650 impact breaker. The material passing this primary crusher and the smaller material passing the scalping screen went onto a 30-inch×128-foot conveyor leading to the secondary unit of the plant.

In the second stage, two 4×8-foot double-deck screens separated the sizes, sending the oversize to a 54-inch roll crusher. Material leaving this crusher was returned to the main feed belt. This completed a closed circuit in the secondary. The finished minus 1½-inch base material dropped into surge bins under the screens and was delivered to waiting trucks by a loading conveyor. This plant was equipped with washing facilities and additional screens to produce a wide range of materials, but these were not used for base rock production. The plant turned out an average of 300 tons per hour.

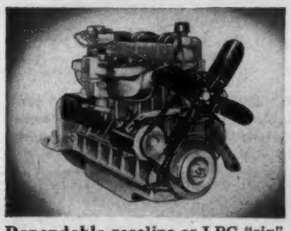
On residential streets, a single 5-

Traction when you need it!

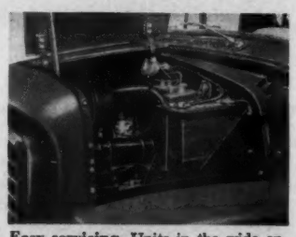
Just one reason why contractors find International Trucks cost least to own!

Negotiate rougher terrain—carry more load in less time—cut operating expenses with rugged all-wheel-drive.

Superior strength Steel-Flex frames test-proven to combine durability with proper flexibility for extra truck life.

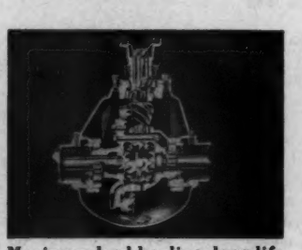


Dependable gasoline or LPG "six" power and economy backed by INTERNATIONAL all-truck engine leadership.



Easy servicing. Units in the wide engine compartment under the hood are located for quick, uncramped servicing.

Easy to handle in tight spots or on the roughest terrain with true geometric steering, cam and roller mounted gears.



Maximum load hauling, long life axles. Front and rear axles are full floating single reduction type.

INTERNATIONAL **Trucks** with *all-wheel-drive* are truck-built tough to make roads where there are none.

You get more traction, more sure-footed power because *all wheels are working*. They move you over sinkholes, mud, sand or snow . . . they grab hold to pull business-sized loads up the steepest grades.

What's more, *every* all-wheel-drive INTERNATIONAL Truck is all-truck manufactured in one plant. You get dependable performance that makes the most out of every workday, plus lasting economy of operation and long life. That's why INTERNATIONAL Trucks cost *least* to own. Fleet cost records prove* it.

When it's time that you need a truck, remember the line that's been heavy-duty sales leader for over a quarter of a century. Then see your INTERNATIONAL Dealer.

**Signed statements in our files, from fleet operators throughout the U.S., back up this statement.*

cost least to own!

INTERNATIONAL HARVESTER COMPANY, CHICAGO

Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

For more facts, use Request Card at page 18 and circle No. 324

Paving starts on one of the city's business streets. Two more finishers will join these two Barber-Greenes to complete the full width of the roadway. These rigs lay about 280 tons of hot-mix per hour.

inch compacted base course was applied. On arterial, business, and federal-aid routes, an 8-inch base was placed in two 4-inch lifts. The placing operation was similar to that for the subbase. Trucks dumped the material on the road, where it was windrowed by motor graders, watered, mixed, spread by the motor graders, and compacted.

Here again, the contractors used a variety of compaction equipment including sheepsfoot, grid, steel-wheel, and pneumatic rollers. In every case, the final rolling was done by pneumatic rollers to densify the surface and protect it until the paving could be applied.

As soon as a block of base was finished and approved by the inspectors, it was given a prime coat of MC-1 cutback asphalt as protection against the weather until the surfacing was placed. The work was so arranged that every other street could be left open to travel. This permitted people to drive within a block of their homes while their streets were closed.

Bituminous paving

While the individual contractors did the grading and base work with their own equipment, all the paving was done with one spread of equipment operated by the joint venture. On the street, this spread consisted of four Barber-Greene pavers, four 10-ton tandem steel-wheel rollers and two Ferguson 25-ton self-propelled rollers. The latter were operated without ballast at a weight of about twelve tons.

The pavers were operated together whenever possible. On a typical 35-foot residential street, three machines worked side by side to lay the entire width of the street in a single pass. This eliminated the possibility of cold joints. The fourth machine was usually kept busy laying nearby intersections or some short block of cross street close by.

On the city contract the pavement was laid in one or two lifts with a total thickness of from 1½ to 3 inches, depending on the type of anticipated traffic. The state required two 1½-inch lifts to be placed. Some existing pavements were tacked with RC-1 cutback asphalt and given a single 1½-inch course of the asphaltic concrete.

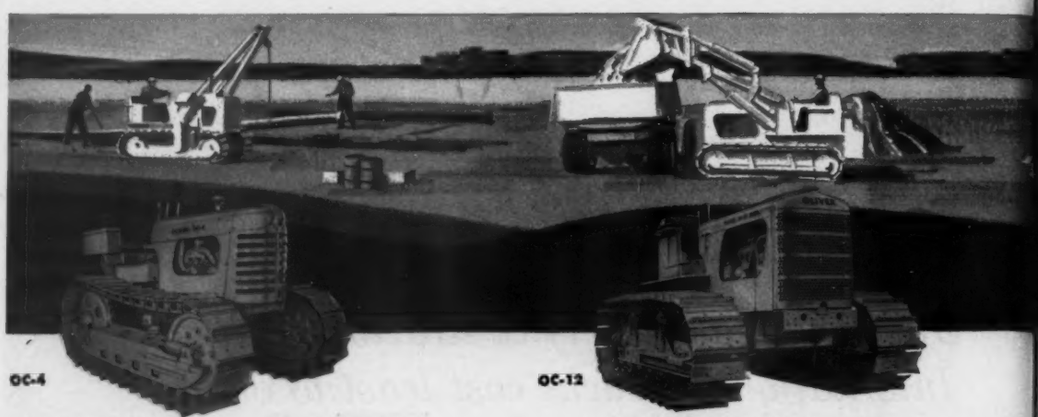
Two plants supply mix

The four pavers were kept supplied with some 280 tons of bituminous mixture by two asphalt plants and a big fleet of trucks. The two plants were located on the same site at the edge of the city, and both worked from the same stockpile of aggregate, which had been placed by City Constructors the year before.

One of the plants, a Cedarapids 4,000-pound-batch-type, belonged to S. Birch, Inc. In this setup, two Caterpillar tractors, a D8 and a D4, fed the coarse and fine aggregates, respectively, to the conveyor leading to the dryer. The hot elevator carried the dried material to a 4×8-foot gradation unit on the top of the tower. The several sizes then traveled by gravity to the weigh bucket and into the 4,000-pound-batch pugmill.

The main plant was operated by a General Motors 6-71 engine through a V-belt drive. A GM 3-71 engine drove the dryer. Some of the other units were powered by electric motors operated from the high lines. Steam heat for the asphalt-storage and handling equipment was supplied

One of the two asphalt plants turning out hot-mix is this Cedarapids 4,000-pound plant operated by S. Birch & Sons Construction Co., Great Falls.



OC-4

—28 net engine h.p. Only crawler tractor in its class designed specifically for heavy construction work. Able, agile, versatile. Full allied equipment: dozer, trencher, backhoe, scraper, winch, side boom. Also 5/8-yd. loader.

OC-12

—62.8 gas or 61.4 diesel net engine h.p. The high performing, high efficiency crawler of long-run, low maintenance. Full-time working power on both tracks. Mounts dozer, trail-builder, scarifier, side boom, winch. Also, 1½-yd. loader model.

SUPER 55

—39.1 gas or 37.0 diesel net engine h.p. Small investment gets you big income job range. Works with full line of front, side and three-point hitch attachments—dozer, 11-cu. ft. loader, trencher, fork lift, mower.

SUPER 77

—49.2 gas or 47.3 diesel net engine h.p. The high production rig in the popular, easy-handling size. Now with torque converter and Reverse-O-Matic for finger touch direction changes. Mounts 5/8-yd. loader, trencher, mower.

PROFIT MARGIN PROTECTORS

Want it on crawlers or wheels? Either way you'll be work ahead with an Oliver tractor. As the biggest builder of both... Oliver is able to apply the advancements of one to the other. This has accelerated Oliver design—toughened Oliver construction—extended Oliver usefulness through a wider job range. You can do more with an Oliver—and stay at it longer. Start your margin of profit up—with the Oliver you need. On crawlers or wheels!

SUPER 99

—103 net engine h.p. Most powerful diesel wheel tractor of its type. For tough drawbar work. Light touch steering. Short turn radius. Torque converter available. Also 1¼-yd. loader model.

OLIVER

THE OLIVER CORPORATION

Industrial Sales Div., 19300 Euclid Ave., Cleveland 17, Ohio

NOW...SEE YOUR EXPERIENCED OLIVER DISTRIBUTOR

by a Cleaver-Brooks 125-hp steam boiler. Both this and the other plant used asphalt from the nearby refinery of Phillips Petroleum Co. The Birch plant usually produced 140 tons per hour.

The second plant, belonging to McLaughlin, Inc., was a Pioneer Model 101. Aggregates were fed from the stockpile to the plant by a D8 tractor-dozer, while blend sand was added by a D4 Traxcavator. An apron feeder delivered the material to the belt conveyor feeding the 8×28-foot dryer. The dried material rode the hot elevator to the 4×11-foot, three-deck screens of the gradation unit. Here, sizes were proportioned by calibrated gates and plate feeders. A short elevator carried the measured aggregates to the continuous pugmill mixer, where the asphalt was added. The mix was turned out at a rate of about 165 tons per hour.

To heat the asphalt storage and handling facilities, McLaughlin used a Hi-Way hot oil heater fired by an Iron Fireman oil burner using No. 3 fuel oil. The dryer of the plant was driven by a Caterpillar D13000 engine, while a General Motors 6-71 engine and electric motors powered the other units. Including time for delays of all types, the two plants furnished material to the pavers at an average rate of about 280 tons per hour, ten hours a day, five days a week.

McLaughlin, Inc., uses a Pioneer Model 101 plant. A conveyor brings aggregates to the 8×28-foot dryer; the hot material then goes to the gradation unit and to the continuous pugmill mixer.

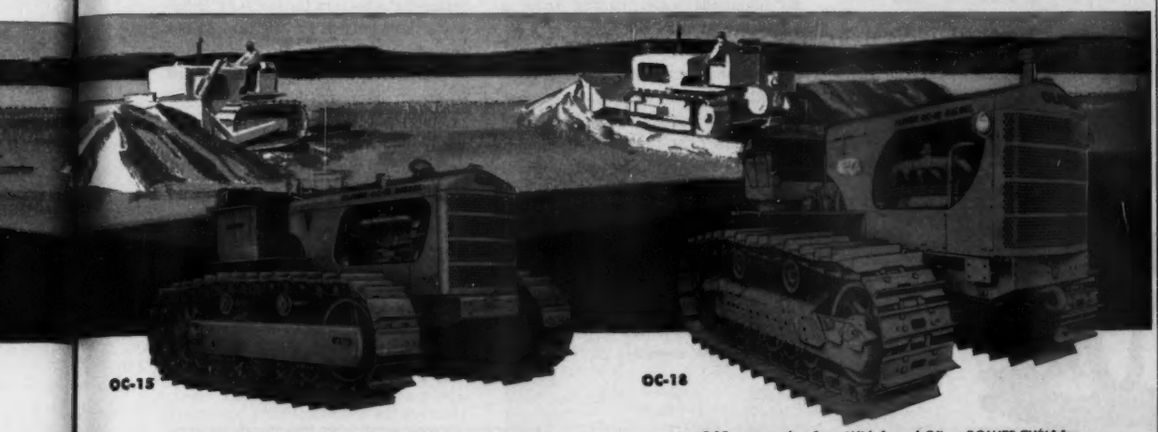
Personnel

Project manager A. C. "Bud" Nesbitt of City Constructors had a busy season. With work scattered over 75 miles of city streets and crews at different points in this area, he spent most of his time in his automobile, keeping in touch with the various units via a Motorola mobile radio system. The usual complications of city work made it necessary for Nesbitt to be a diplomat and a peacemaker as well as manager.

The general superintendent for City Constructors was John Clayton, while Bill Radovich handled the asphalt-paving crews. Ed Falkner was office manager for the joint venture. Supervising the work at the several sites were area superintendents Larry Mahon for the Birch companies, Frank Crilly for McLaughlin, and A. L. Williams for Nilson-Smith.

Clifford Dier, a senior partner of Harold Hoskins & Associates, headed the project staff for the consulting engineers. Carl Christopherson was project engineer, and James Nichols was assistant project engineer. Materials inspection and testing were handled by Western Laboratories, Inc., Lincoln, Nebr. The inspection staff was headed by materials engineer Eugene Smith and his assistant, William Shultz.

A. J. Richardson is City Engineer of Great Falls. THE END

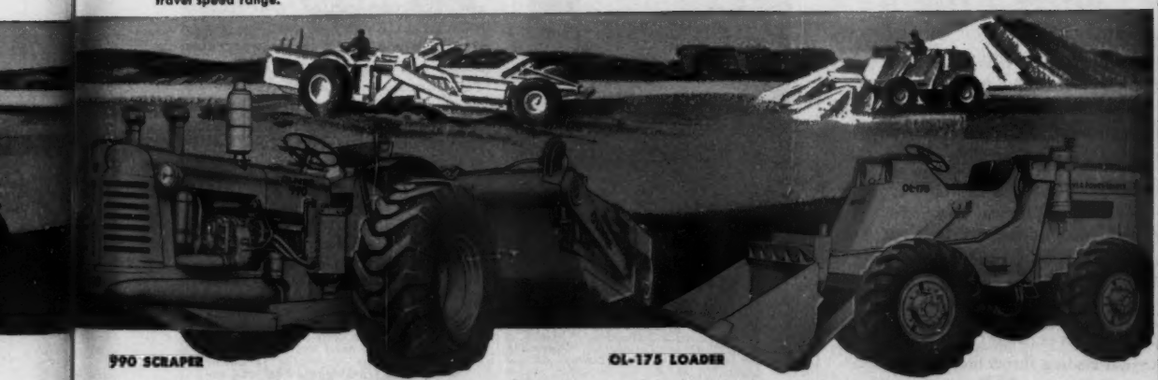


—110 net engine h.p. Newest design with greatest power to weight ratio of any tractor in its class! Two track turning power. Dozer, angleblade, scarifier, winch. 2¼ yd. loader model also.

—161 net engine h.p. With famed Oliver POWER-TURN for spot turns with locked track or tight turns with both tracks powered—plus instant speed changes and drawbar pull without shifting. Dozer, angleblade, winch.

THIS YEAR TRIM YOUR COSTS with an OLIVER '58!

—60.8 gas or 58.3 diesel net engine h.p. Nothing faster in its class for rapid cycle loading (3/4 yd.) or trenching (1/2 yd.)...or at any work you give it. Easy handling, wide travel speed range.



—6.7 yd. heaped capacity. Sized right and priced right for the small contractor who wants to profit from scraper economies ...and also the big operator who needs versatile, clean-up and supplementary rig. All hydraulic. Torque converter available.

—109 gas or 133 diesel net engine h.p. Newest in the field—proved in the field. For loading, digging, clearing. New foot controls give fast forward-back travel changes with quick speed response. 4-wheel drive, torque converter. 1¾-yd. loader. Also dozer, other attachments.

You'll like your Oliver distributor's personalized sales and service. Whether your equipment needs are large or small, you can be sure of the kind of alert service that keeps your jobs on schedule.

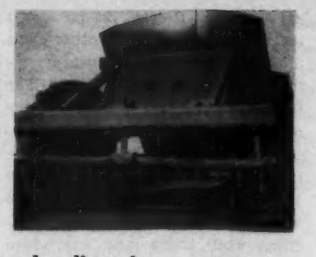
Pa. highway department establishes new Office

The Pennsylvania Department of Highways has established an Office of Planning and Research for state highway improvements. The new department will concentrate on advance acquisition and early delineation of right-of-ways; protection of present and proposed highways from disfigurement; long-term financial planning; and procedures for carrying out decisions promptly and efficiently.

The department also announces a policy for the expansion of roadside rest facilities on the state road system. Construction of roadside rest areas on the Interstate System, simultaneously with roadway and bridge construction, is also under consideration.

←For more facts, circle No. 325

An International 75 Paywagon, converted into a water wagon, makes a 5-minute stop for 5,418 gallons of water during grading for a 13,500-foot runway at the SAC bomber base at Amarillo, Texas. The bottom-dump section has been replaced with a welded underbody, the rig's sides built up, and a cover added.



This spraybar with 1¼-inch nozzles—15 of them—provides enough water for extra-high compaction. The flow is controlled by an air-actuated valve within easy reach of the operator.

Earthmovers converted to water-hauling rigs during runway compaction

Faced with the necessity of distributing 40,000 gallons of water an hour to compact material to 95 per cent of its original density, Terra Construction Co., Great Bend, Kans., devised an ingenious water carrier from a giant earthmover.

The water was needed for a 13,500-foot runway being built by Terra Construction Co. for the SAC jet bomber base at Amarillo, Texas, to handle B-52 bombers and other large planes.

Using a fleet of eight International 75 Payscraper units, Terra is moving 4 million cubic yards of material, shifting 25,000 cubic yards on 20-hour daily shifts.

Because of the extra-high compaction necessary for this material, Terra felt the highway-type tank truck would not be adequate. Instead, two International bottom-dump Paywagon units were converted into water carriers. The bottom-dump sections were removed, and 3/16-gage steel plate was welded to form a water-tight bottom for the tank. Sides watertight bottom for the tank. Sides top cover was welded in place.

Water flow is controlled by means of an air-actuated valve within easy reach of the operator. This valve, formerly controlling the bottom-dump unit, permits a gate valve mounted on the bottom rear end of the tank to control flow through the spray bar.

These mammoth water trucks each hold 5,418 gallons of water, and the capacity can be increased by elevating the sideboards. The trucks can be loaded to full capacity in 5 minutes; unloading takes about 10 minutes.

New Optical Plummet Built into Gurley Transit Saves Set-up Time, Improves Accuracy on Windy Days

Years ago, Gurley introduced lightweight instruments to combat wind vibrations. Now Gurley further beats the wind problem with an optical plummet *built into* the instrument.

The new Gurley Optical Plummet Transit eliminates swing and sway of the cord and plumb—always time-consuming and exasperating on a windy location, and inaccurate as well. Positive accuracy of set-up is assured with the Gurley Optical Plummet.

The new Gurley transit is furnished with a tripod with built-in shifting head, and allows a two-inch shift of the instrument over the point. This provides greater latitude in initial set-up.

Gurley's new Optical Plummet Transit offers one of the advantages of the optical-reading theodolite *plus* the desirable features of simplicity and universal acceptance of the American transit. For further details, ask for Bulletin OP-100.

GURLEY

W. & L. E. GURLEY, Fulton & Station Sts., Troy, N. Y.

For more facts, use Request Card at page 18 and circle No. 326

LIMA ROADPACKER

No other compacting equipment is designed so completely for high-density consolidation of single course *Macadam Bases, Gravel Subbases* and *Soil-Cement Bases*

Widener Attachment—Vibrating shoes compact material in widening trench while Roadpacker runs on existing pavement. Easily adjusted for various width trenches.

Six 420 lb. shoes provide the vibrating and tamping action. The LIMA ROADPACKER is a cost-cutting, vibratory compactor that penetrates deeper and covers a 13-ft., 1-in. width. The shoes are raised and lowered hydraulically; compacting is done equally well forward or in reverse. The ROADPACKER travels to the job at 28 m.p.h.

Get the full story on the LIMA ROADPACKER today. See your nearby distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

ROADPACKER FEATURES

- **Low maintenance**—*Rugged vibrator shoes are pressure lubricated and actuated hydraulically through a completely sealed system. There are no exposed moving parts, no oil levels to check, no breather holes through which oil can escape.*
- **Fast and maneuverable**—*Highway speeds up to 28 m.p.h., reverse speeds up to 7 m.p.h. Steers easily. For work in tight places, can be operated with only four shoes. Shoes can be folded up easily and need not be removed.*
- **Easy to operate**—*Operator is above dust, away from engine heat and exhaust for maximum comfort and efficiency. He has excellent visibility . . . controls are readily accessible.*

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LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON
Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

For more facts, use Request Card at page 18 and circle No. 327

Product LITERATURE

For further information on any of the literature described in the following section, circle the designated number on the Request Card at page 18.

Versatile power unit—a bulletin describing the Allis-Chalmers B-125 power unit. Illustrates various components of the unit, and also contains two large cutaways of the unit. Includes specifications, as well as a list of special equipment.

Write to the Tractor Group, Allis-Chalmers Mfg. Co., Dept. C&E, P. O. Box 512, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 43.

Concrete carrier—a profusely illustrated brochure describing Oshkosh 4-wheel-drive and 6-wheel-drive concrete carriers. Action photographs point up the benefits of the carriers' all-wheel traction, and a combination photograph and diagram illustrates the small turning circle and maximum maneuverability inherent in their design. Detailed specifications.

Write to Oshkosh Motor Truck, Inc., Dept. CC, Dept. C&E, 2300 Oregon St., Oshkosh, Wis., or use the Request Card at page 18. Circle No. 135.

Paving without forms—literature describing the Quad-City Model SF-25-B Slip-Form concrete paver designed to eliminate paving forms by the complete compaction of the concrete. Details construction and performance characteristics of the unit, and is illustrated with photographs and drawings.

Write to the Quad-City Equipment Co., Dept C&E, P. O. Box 274, Rock Island, Ill., or use the Request Card at page 18. Circle No. 136.

Tractor, power unit maintenance—an informative booklet describing essential service tools for Caterpillar tractors and power units. Copiously illustrated, shows many of the tools performing a wide variety of maintenance and repair work. Bulletin CT-57.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 137.

Off-the-road hauler—a brochure on the Yuba Movall. Offers data on many of the big off-the-highway hauler's important features, with emphasis laid on the Yuba ejector-type dumping action. Illustrated with drawings and on-the-job photographs. Specifications included for both the 22 and 32-ton models.

Write to the Yuba Consolidated Industries, Inc., Yuba Mfg. Division, Dept. C&E, 701 E. H St., Benicia, Calif., or use the Request Card at page 18. Circle No. 138.

Crane-excavator—a bulletin describing the new 7-ton rated Bantam Model CR-35 self-propelled crane-excavator. Operating data, features, specifications. Charts show lifting capacities and digging ranges for crane, shovel, and backhoe attachments. On-the-job photos, and close-ups of major components. Bulletin No. CR-502.

Write to the Schield Bantam Co., Dept. C&E, 200 Park St., Waverly, Ohio, or use the Request Card at page 18. Circle No. 139.

Vibrating screens, feeders—a folder on the Dravo-Schenck line of vibrating screens, feeders, and conveyors. Photographs, drawings, and diagrams illustrate the text.

Write to the Dravo Corp., Dept. C&E, Dravo Bldg., Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 140.

Versatile boom—a brochure describing the Mi-Jack boom for mounting on various type trucks. Details the design and performance characteris-

2,400 foot retaining wall poured prior to construction of Shepard Road, a main traffic artery in St. Paul, Minnesota.

70 feet of river retaining wall completed in one pour by GANG FORMING

SYMONS Wide Panel Forms

Symons Steel Strut Wide Panel Forms have 2 x 4 cross members to strengthen the panel and minimize deflection when pouring. Panels are built in 6' and 8' lengths and 30", 36" and 48" widths. Fewer panels per job are required with Steel Strut Wide Panels.

Pouring of a 2,400 foot retaining wall along the north bank of the Mississippi River in downtown St. Paul was accomplished with Symons Wide Panel Forms made up in gang sections of 10' x 24' and 15' x 24'. Panels 4' x 6' and 3' x 6' were used to form the sections.

Hurley Construction Company, St. Paul, contractor on the job, used only 5,400 square feet of Symons Wide Panel Forms. By gang forming, Hurley was able to speed construction and meet tight time schedule. 70 lineal feet of concrete was poured in one pour with a maximum pour of 700 lineal feet in one week. Walls were battered, 19 inches at the bottom and 12 inches at the top.

Handling of the sections with a crane was made easy by using a cable behind the top waler and a 3 by 8 plank permanently bolted about 18 inches from the bottom of the section. Walers and stiff backs were put on permanently.

Engineering Service—Our Engineering service includes preparing, from your plans, a complete form layout and costs sheets—no charge or obligation. For additional information on Symons products and services send for our FREE catalog.

Symons CLAMP AND MFG. CO.

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tics of the unit, stressing the use of Braden winches in its construction. On-the-job photographs illustrate the boom's exceptional versatility.

Write to Mi-Jack Products, Inc., Dept. C&E, 110 S. Dearborn St., Chicago 3, Ill., or use the Request Card at page 18. Circle No. 141.

Self-propelled compactor, others—a folder featuring the Seaman-Gunnison Duo-Pactor, a combination rubber-tire and steel roller. Also contains data on the firm's 6-cubic-yard utility scraper; 800 to 4,000-gallon truck and trailer-mounted bituminous distributor; and Hydro-Jet flushers and water distributors. Action photographs and condensed specifications.

Write to the Seaman-Gunnison Corp., Dept. G, Dept. C&E, 2763 S. 27th St., Milwaukee 15, Wis., or use the Request Card at page 18. Circle No. 142.

Continuous asphalt plants—a booklet titled "Principles of Barber-Greene Continuous Asphalt Plants". Illustrated description of exactly how a continuous asphalt plant operates; the differences between continuous and batch-type plants; plant functions and the methods of continuous measurement of both aggregate and asphalt. Also contains data on laboratory analyses of continuous mixes.

Write to Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 143.

Tractor-servicing tools — an Owatonna Tool Co. service bulletin covering Ford tractor Models 600, 700, 800, and 900. Illustrates step-by-step operations for various tough jobs using specially designed OTC hydraulic and manual tools. Also pictures special tools and sets engineered expressly for Ford tractors, plus a wide range of tools for general use.

Write to the Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 144.

Gas, arc welding supplies—a 48-page catalog on the Air Reduction line of supplies and accessories for gas and arc welding. Contains over 100 illustrations. Form ADC848B.

Write to the Air Reduction Sales Co., Division of the Air Reduction Co., Inc., Dept. C&E, 150 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 145.

Concrete batch plants—a catalog describing Greco concrete batching plants. Contains specification drawings for each of the firm's cement and aggregate batching plants. Stresses such features as unit construction and flush mounting. Photos show typical installations as used by roadbuilders, ready-mix plants, block plants, prestressed plants, and pipe plants. Catalog G101.

Write to L. O. Gregory Engineering, Dept. C&E, 2697 Barron Ave., Memphis, Tenn., or use the Request Card at page 18. Circle No. 146.

Transit-mix maintenance—an illustrated preventive maintenance chart for concrete truck mixers. The sixteen steps outlined on the chart, from hold-down bolts to water pumps, apply to all makes of mixers and are designed to cut down on repair costs. Designed to be displayed on garage walls and other conspicuous places. Bulletin No. G-2486-P.

Write to the Worthington Corp., Dept. C&E, Worthing and Harrison Aves., Harrison, N. J., or use the Request Card at page 18. Circle No. 147.

Air compressors—literature describing the entire line of Westinghouse unit type and Le Roi stationary air compressors. The compressors described range in size from ½ to 100 horsepower and include both single and two-stage units. Includes some specifications, and is illustrated with photographs and drawings.

Write to the Le Roi Division, Westinghouse Air Brake Co., Dept. C&E, 3716 W. Wisconsin Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 148.

Lightweight scaffolds—a folder describing the construction features and adaptability of Baker scaffolds. The units are highly maneuverable and feature platforms that are adjustable every three inches, according to the literature. Illustrated with drawings and photos.

Write to Baker-Roos, Inc., Dept. C&E, 602 W. McCarty St., Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 149.

Concrete-cutting blades—a brochure on masonry and concrete-cutting blades from the Clipper Mfg. Co. Covers diamond, break-resistant, and abrasive blades, including small-diameter blades for use on all power handsaws. Bulletin No. 3006.

Write to the Clipper Mfg. Co., Dept. C&E, Suite 149, 2800 Warwick, Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 150.

Hardsurfacing guide — handy, shirt-pocket-size Ranite Select-O-Graph guides offering an easy method for welders to quickly select the proper grade of hardsurfacing rods. Carries the same indicative color-coding as do each of the seven Ranite hardsurfacing rods. Also contains information concerning performance characteristics of each rod, polarity, rod sizes, position information, and Rockwell hardness.

Write to the Rankin Mfg. Co., Dept. C&E, 616 S. Marengo, Alhambra, Calif., or use the Request Card at 18. Circle No. 151.

Vibrating screen—a booklet describing five new larger-size models of the Symons rod deck screen for high-capacity separations of dry, wet or sticky materials. A diagram illustrates the multiple vibratory motion which the screen imparts to the material, and photographs show how simply individual rods can be replaced. Dimensional drawings of all sizes of the screen.

Write to the Nordberg Mfg. Co., Dept. C&E, 3073 S. Chase Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 152.

Trucks—a catalog describing six heavy-duty International all-wheel-drive truck models of cab-forward design, with GVW ratings of 18,000 to 33,000 pounds. Colorfully illustrated with photographs and drawings. All units described are available with either gasoline or LPG engines. Form CR-205-G.

Write to the International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 2.

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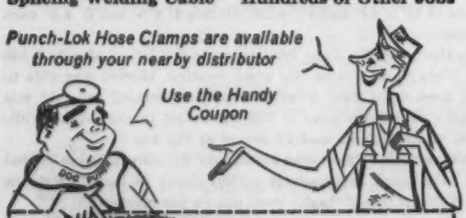

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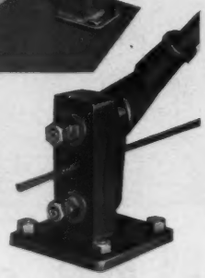

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Tractor maintenance—a 24-page maintenance guide for Caterpillar D7, D8, and D9 tractors. Written in narrative form, it tells the story of how one tractor owner learned to keep his machine on the job with lower maintenance costs. Cartoon-type drawings help point out good maintenance practices.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 153.

Drag-bit drill head—an illustrated fact sheet describing Austin Powder Co.'s Model APA drag-bit drill head. Discusses and illustrates in detail how the step drilling pattern of the APA can increase penetration and reduce bit wear in air drilling of soft rock formations. Form LL-6126.

Write to the Austin Powder Co., Dept. C&E, Rockefeller Bldg., Cleveland 13, Ohio, or use the Request Card at page 18. Circle No. 154.

Mobile machine shops—a bulletin describing the Davey Compressor Co.'s complete line of mobile machine shops. Illustrated with photos and blueprints of typical shops, the leaflet describes truck-mounted units designed to meet all needs of users operating over extensive areas. Bulletin No. E-208.

Write to the Davey Compressor Co., Dept. C&E, Franklin Ave., Kent, Ohio, or use the Request Card at page 18. Circle No. 155.

Testing equipment—a booklet describing physical testing equipment for constructional materials. Gives details and specifications on laboratory-type compression testing machines, Super L hydraulic compression machines with electronic load indication, semiportable concrete block cylinder and beam testers, and other machines and accessories. Bulletin 55.

Write to the Tinius Olsen Testing Machine Co., Dept. C&E, 7619 Easton Road, Willow Grove, Pa., or use the Request Card at page 18. Circle No. 118.

Roller-compactor—a detailed specification sheet describing the Austin-Western Model RV-20 vibrator for use with the company's Model 102 3-wheel roller. Photographs show the vibrator mounted on the roller. Available with the spex sheet are job stories on the roller-compactor's pilot model test.

Write to Austin-Western, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Dept. C&E, 601 N. Farnsworth Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 8.

Paving forms—a colorfully illustrated bulletin describing the new Clark paving forms featuring the Wedge-Lok joint. Text includes information on the design and application of the forms, with specifications included. Bulletin CRPF-376.

Write to Clark Industries, Construction Equipment Division, Dept. C&E, 375 E. Fifth Ave., Columbus 1, Ohio, or use the Request Card at page 18. Circle No. 156.

Cabs for tractors—literature describing Northeast steel-top all-weather cabs for tractors. Lists such features as loader and backhoe controls inside, wide range visibility, and simple installation. Photographs; brief specifications.

Write to Northeast Equipment, Inc., Dept. C&E, 7 Brookfield St., Worcester, Mass., or use the Request Card at page 18. Circle No. 157.

Tractor shovel—a brochure on the 2-cubic-yard Trojan Model 154 tractor shovel. Details construction and operating features. Drawings, action photos, specifications, and a list of standard and optional equipment.

Write to the Yale & Towne Mfg. Co., Contractors Machinery Division, Dept. C&E, Clinton St., Batavia, N. Y., or use the Request Card at page 18. Circle No. 158.

New excavator—a fact sheet describing the new Pippin Champion Model 350 excavator. According to the literature, the unit easily digs deeper than 13 feet anywhere within the 180-degree arc of swing, reaches more than 19 feet behind the rear axle, and will load higher than 10 feet. Illustrated with drawings. Brief specifications.

Write to Pippin Construction Equipment, Inc., Dept. C&E, White River Junction, Vt., or use the Request Card at page 18. Circle No. 130.

Sling chains—an informative bulletin on Accoloy Kuplex sling chains. Describes the manufacturer's sling chain service program instituted to solve problems of slow delivery. Contains helpful data on choosing proper chain size and style; working load limits at various angles; basic com-

(Continued on next page)

For the National Sand and Gravel Association and National Ready Mixed Concrete Association convention news read C&E's Chicago Convention Dailies, published February 10, 12, and 13.

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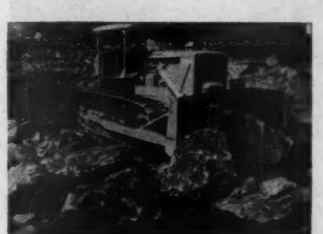
Result: New CAT Scraper and 'Dozer cutting edges, built to withstand increased demands of today's machines, are top buy.

The cutting edge of a bulldozer or scraper takes more punishment than any other part of the machine. And more punishment today than ever before. New, larger, more powerful machines make greater demands on cutting edges.

New Caterpillar cutting edges match the superb quality and performance of Caterpillar earthmoving equipment. They are built to stay on the most grueling jobs, day after day, without breaking or bending. There is no better buy at any price.

Field tests prove that the new Cat cutting edges not only outwear other make edges of the same thickness; they even outlast the thicker edges of other manufacturers.

To manufacture such tough edges, Caterpillar engineers perfected a hardening process to give steel the right blend of toughness and hardness—toughness to prevent breaking, hardness to prevent bending and rapid wear.



ROUGH JOBS like this put cutting edges to severe test. And here is where tough Caterpillar edges prove their superiority.

A quality edge starts with quality steel, tested in Caterpillar's laboratories for the right chemical composition and physical characteristics. Only steels meeting these exact specifications are accepted, and further tests are made at every stage of production.

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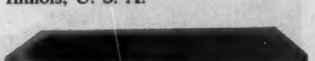
Your Caterpillar Dealer has full information about the new Cat Scraper and 'Dozer cutting edges. See him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



CROSS SECTION of edge showing armor-like case and its shock-absorbing core.

CATERPILLAR

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"HI-ELECTRO" hardening machines at the Caterpillar factory give cutting edges the strength to resist breaking and bending.

For more facts, use Request Card at page 18 and circle No. 333

ponents required to make a sling; and information on assembly and repair of these sling-chain assemblies.

Write to the American Chain Division, American Chain & Cable Co., Inc., Dept. C&E, E. Princess and Thomas Sts., York, Pa., or use the Request Card at page 18. Circle No. 107.

Generating equipment; others—a 60-page catalog describing new and surplus electrical generating equipment from the Groban Supply Co. Also describes various types and makes of hydraulic equipment including motors, pumps, cylinders, and mast assemblies, both new and surplus. Illustrated with drawings, photographs, sketches, and diagrams. Catalog No. 572.

Write to the Groban Supply Co., Dept. C&E, 1139 S. Wabash Ave., Chicago 5, Ill., or use the Request Card at page 18. Circle No. 31.

Dump bodies—a folder describing Speedlift dump bodies. Contains data on Daybrook's dump-body designs and construction, special features, hardware, and dump-body applications. Illustrates some of the standard models available.

Write to the Daybrook Hydraulic Division, L. A. Young Spring & Wire Corp., Dept. C&E, Bowling Green, Ohio, or use the Request Card at page 18. Circle No. 159.

Adaptable rolling scaffold—literature illustrating how to make flush-top platforms higher, wider, narrower, or lower with the new Fold-A-Way rolling scaffold. Also illustrates work platforms made by a variety of combinations. All of these set-ups easily fold to go through a 30-inch door, the literature states. Catalog CS 130.

Write to the Superior Scaffold Co., Dept. C&E, 5624 Bankfield Ave., Culver City, Calif., or use the Request Card at page 18. Circle No. 99.

Direct reading rod—a bulletin describing the Lenker L-E-Vation rod, a direct reading level rod said to eliminate all computations. Drawings illustrate the step-by-step instructions included in the text.

Write to the Lenker Mfg. Co., Dept. C&E, 599 Chestnut St., Sunbury, Pa., or use the Request Card at page 18. Circle No. 129.

Sand plants—a folder discussing sand plants from Dorr-Oliver, Inc. Brief description of several plant components. Illustrations include typical sand preparation flowsheets, as well as photographs of four installations.

Write to Dorr-Oliver, Inc., Dept. C&E, Barry Place, Stamford, Conn., or use the Request Card at page 18. Circle No. 106.

Motor-grader accessories—a brochure entitled "Accessories and Attachments for Allis-Chalmers Motor Graders". Designed as a handy reference for owners and users of the Allis-Chalmers Model 45 and Model D motor graders. Illustrated with drawings. Bulletin MS-1161.

Write to the Construction Machinery Division, Tractor Group, Allis-Chalmers Mfg. Co., Dept. C&E, P. O. Box 512, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 44.

Lift-truck lubrication—an industrial lift-truck lubrication guide containing manufacturers' lubricant recommendations for some 300 models of 24 leading makes, tabulated in terms of Kendall products. Refill capacities for crankcases, gear cases, and hydraulic systems are shown in many instances. Also contains lubrication data for steering gear assem-

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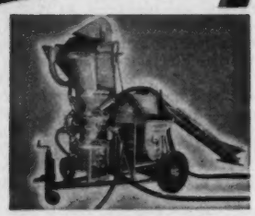

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Not just one, but your choice of three models.

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blies, linkages, bearings, pressure-gun fittings, others.

Write to the Kendall Refining Co., Dept. C&E, 77 N. Kendall Ave., Bradford, Pa., or use the Request Card at page 18. Circle No. 119.

Wheel tractors, allied equipment—a catalog covering the complete line of M-R-S heavy diesel wheel tractors and allied equipment available for them. Detailed description of the M-R-S hydraulic weight transfer, as well as brief specifications for all tractors and scraper equipment. Illustrated with photos and drawings.

Write to the M-R-S Mfg. Co., Dept. C&E, Flora, Miss., or use the Request Card at page 18. Circle No. 160.

Foul-weather clothing—a fact sheet describing the new Jomac line of polyvinyl chloride-impregnated North PVC garments. Reviews and illustrates three basic garments: a full-length coat, overalls, and a short coat usually worn with the overalls. Illustrated with sketches and photographs.

Write to Jomac, Inc., Dept. C&E, 6128 N. Woodstock, Philadelphia 38, Pa., or use the Request Card at page 18. Circle No. 116.

Concrete-pipe protection — a folder describing Teckote-100, a new protective coating for concrete and metal pipe. Teckote-100 can be applied in a single operation, without heat, and handled within an hour without damage, according to the literature. Data on results of bond, water-absorption, and chemical-resistance tests. Illustrated with photos and charts.

Write to the Teckote Corp., Dept. C&E, P. O. Box 155, Birmingham, Ala., or use the Request Card at page 18. Circle No. 117.

Lightweight compactor—a booklet describing the Wacker GVR 100, a one-man, self-propelled compacting machine for both cohesive and uncohesive materials. Text and diagrams detail the characteristics, maneuverability, and compactive ability of the unit in comparison with other type machines. Includes case histories illustrating economy, and a list of suggested applications.

Write to the Wacker Corp., Dept. C&E, Hartford, Wis., or use the Request Card at page 18. Circle No. 101.

Concrete-gunning equipment—a booklet describing Airplaco Bondactor and Nucretor concrete-gunning machines; Mix-Elvators; portable gunning rigs; and accessories. Discusses the advantages of air-placed concrete, and on-the-job photographs depict the many applications for gunning equipment. Brief specifications.

Write to the Air Placement Equipment Co., Dept. C&E, 1009 W. 24th St., Kansas City 8, Mo., or use the Request Card at age 18. Circle No. 16.

Washer-classifier-dehydrators—literature describing and illustrating various installations of Eagle washer-classifier-dehydrators. Also contains a cutaway drawing of a heavy media separation plant with 100-tph capacity.

Write to the Eagle Iron Works, Dept. C&E, P. O. Box 934, Des Moines, Iowa, or use the Request Card at page 18. Circle No. 102.

Asphalt heater-planer—illustrated literature describing the Monatco Model M-2, a unit that heats and planes asphalt roads in one operation. Cites the machine's many new features, with specifications included.

Write to the Monatco Mfg. Corp., Dept. C&E, 1401 Woodland, Kansas City, Mo., or use the Request Card at page 18. Circle No. 17.

Portable batching plants—a bulletin describing Burmeister portable batching plants for road paving. A handy reference chart illustrates several plant layout suggestions for a variety of work requirements. Also includes data on available batching controls — manual, semiautomatic, and fully automatic. Illustrated with dimensional drawings and on-the-job photographs.

Write to the Burmeister Division of the Chain Belt Co., Dept. C&E, 4335 W. Mitchell St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 98.

Truckers' costs—the 36th annual edition of The White Motor Co.'s cost record book for truck fleets. The book has a new cover and is revised for modern fleet cost practices. Available to all truck operators.

Write to The White Motor Co., Dept. C&E, 842 E. 79th St., Cleveland 1, Ohio, or use the Request Card at page 18. Circle No. 38.

Blasting caps—a pamphlet on Hercules blasting caps. Describes several types of caps for various applications, with an illustration of the internal structure of each type.

Write to the Hercules Powder Co., Dept. C&E, Delaware Trust Bldg., Wilmington, Del., or use the Request Card at page 18. Circle No. 112.

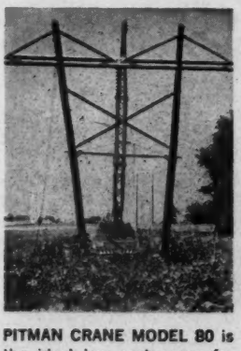
HYDRA-LIFT MODEL 60-HB

Swing the boom, Lift it, Telescope it

with a simple movement of the wrist

That's all, thanks to hydraulic power . . . just move a lever and you put the boom of this amazing new Hydra-Lift exactly where you want it, in seconds. Right or left, up or down, in or out, with or without a load! Enables you to work in tight spots you can't get near with an A Frame or ordinary crane. Three-ton capacity, controls inside the truck, outside or both, every design feature tested and proven in the field. We say it's the most completely useful truck crane ever developed for utilities and municipalities. Why not find out for yourself. Write today!

Hydra-Lift Model 60-HB is shown here with hydraulic auger, operated by same hydraulic system which operates Hydra-Lift. This accessory attaches easily to Hydra-Lift, gives you highly mobile, efficient drilling rig.



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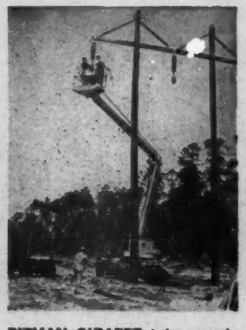
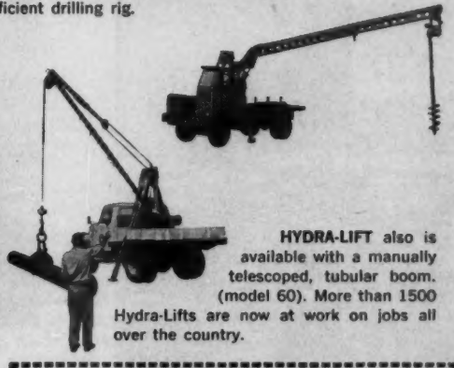


PITMAN GIRAFFE takes workmen and their tools up to the job in complete safety, in seconds. Now available in three models for working heights of 40', 50' and 65'.



HYDRA-LIFT also is available with a manually telescoped, tubular boom. (model 60). More than 1500 Hydra-Lifts are now at work on jobs all over the country.

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A P&H truck crane lowers a 1-yard bucket for a new load as a transit-mix truck backs into the site from 89th St. The crane buckets concrete to crews working on both the administration and museum structures.

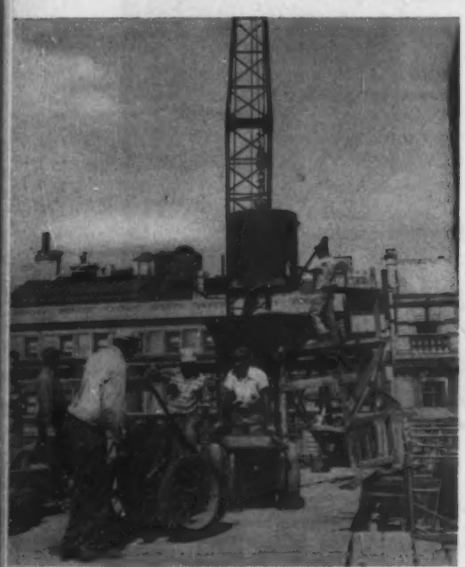
The ramp of the Guggenheim Museum coils on itself as it rises toward the third level. At left, workmen prepare forming. Just beyond the semicircular stairwell-elevator portion, a P&H crane buckets concrete to a hopper that keeps power buggies supplied. The surveyor's tower in the open court is extended as the ramp rises.

Intricate forming highlights New York museum building

Constant variation in formwork is needed for ramp that spirals upward around sides of circular building

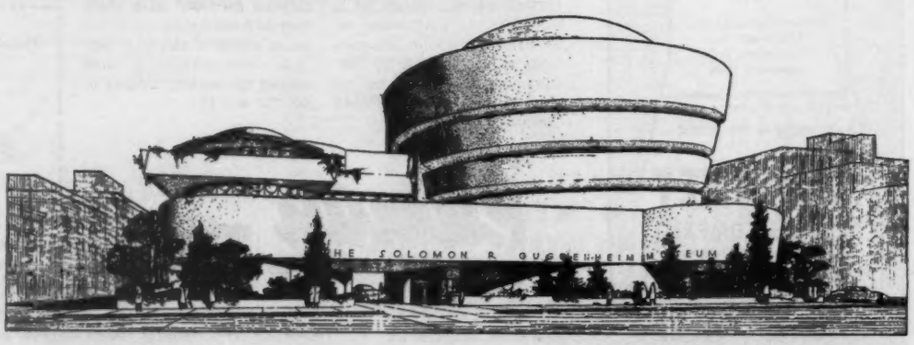
by ANTHONY N. MAVROUDIS, field editor

Complicated plywood formwork—more than 64,000 square feet of it—represents one of the biggest jobs on the Solomon R. Guggenheim Foundation Memorial Museum between 88th and 89th Streets along New York's Fifth Avenue at Central Park. Forming has to be revised constantly for pours that will total 8,000 cubic yards of reinforced concrete for Frank Lloyd Wright's first architectural venture in New York City.



At the ramp level being poured, concrete is dumped into a hopper. These Jackson hand buggies, used for hard-to-reach pours, enable the contractor to use lighter formwork. Timber plank sections protect forms and reinforcing, and provide a runway.

A Mall vibrator is used to consolidate concrete for one of the museum webs. There are 11 of these, spaced at 30 degrees on either side of the stairwell-elevator section. The 4×4-inch timber shoring rests on the completed ramp section below.



The museum consists of two structures, the museum or exhibition gallery and the administration building, which are tied together with a wide concrete band fronting on Fifth Avenue. The museum section, at the corner of 88th Street, consists of an enclosed, continuous spiral ramp starting at ground level and ending about 61 feet above the street. The ramp spirals upward around a court capped with a glass dome skylight, that will give the building a height of about 90 feet.

The contractor, Euclid Contracting Corp., New York, N. Y., which has Charles W. Spero as superintendent, has some unique work on its hands. The concrete ramp, increasing in width as it rises, requires formwork to be constantly revised. Conventional columns have been eliminated; ribs spaced on 30-degree centers around the museum support the cantilevered ramp, and these ribs widen gradually as the building rises to give adequate support to the ramp slab. The business and administration building on the opposite corner is a bit more conventional in that it will have horizontal floors and rooms. But its shape has also made form construction difficult.

Museum building

The museum foundation consists of reinforced-concrete spread footings on soft rock. These support six 4-foot-diameter columns that are equally spaced around a 64-foot-diameter circle. The columns rise 15 feet to about the existing street level, where a circular ring beam, 64 feet in diameter, was formed to cap the columns. The columns were formed with 4-foot-diameter Sonotubes enclosing 2-foot-diameter Sonovoids.

The circular cap beam is about 2 feet thick. It supports a 12-inch-thick cantilevered slab which forms the ceiling of the lecture hall area below street level. This slab, also acting as the ground floor of the museum, cantilevers in toward the center of the 64-foot circle and is supported by the columns. It also extends out beyond the columns to be anchored at the outside edge by exterior and interior partition walls. Along the Fifth Avenue side of the museum, the slab is anchored by a 40-inch-thick wall having scalloped openings along the top. Access to the lecture hall is provided by an outside ramp running along this wall from Fifth Avenue, or by a staircase or elevator from the ground floor of the museum.

Just to the left of the main gallery entrance on the ground-level floor, a ramp 8 feet 3¾ inches wide starts upward in a clockwise direction. This ramp continues for a short distance to a level landing. Here, the ramp reverses direction; for the remaining height of the building, it runs counter-clockwise. As the ramp spirals upward, its width increases along both edges. Beyond the second level, the ramp, as well as the entire building, is supported by the concrete webs, or

(*Continued on next page*)

Sections of ⅝-inch-thick plywood sheets are positioned for one of the top slabs of the administration building. The number of curving sections of the museum required much forming to be cut to fit.

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(Continued from preceding page)

Another gallery area (right) is being built just off the main structure while scaffolding is being erected for the exterior walls between the museum and administration building. This portion will be supported by steel pipe columns and have a gunited exterior wall.

ribs, which are equally spaced around the circumference of the building.

The ramp, 13½ inches thick at the webs, becomes progressively thinner until, along the cantilevered edge of the ramp, it is about 4 inches thick. At this edge, a plaster parapet wall will be built around a metal frame for protection. The 3-inch-thick parapet will extend about two feet below the edge of the ramp and then cut back about six feet to join the base of the ramp. Enclosed in this triangular projection beneath the ramp will be the air-conditioning ductwork.

Along the northern side of the museum, where the semicircular elevator shaft and stairwell are located, the ramp runs into a 22-foot-wide circular platform at each ramp level. This will permit visitors to leave or enter the exhibition gallery at any one of the seven levels of the spiral ramp. Visitors may take the elevator to the top level and view the exhibits as they descend the ramp or walk up the ramp and take the elevator down.

The webs supporting the ramp will also act as partition walls between galleries, which will have paintings hung on the inside of the curtain walls of the building. There are eleven of these webs on 30-degree centers, and the place of the twelfth is taken by the bearing partition walls of the elevator shaft and stairwell.

The 5-inch-thick exterior walls between the ramp levels—all non-bearing walls above the second ramp level—will be formed by the gunite process. A wire-glass skylight, running along the top of the walls below the ramps, will provide the desired natural lighting in this window-free structure. Below the second ramp level, the exterior walls were cast in place to support a cantilevered circular slab at the corner of 88th Street and Fifth Avenue.

Circular slab

This circular slab consists of two 4-inch-thick concrete slabs separated by 4-foot-deep beams that cantilever from the 20-inch-thick exterior wall between the first and second ramp levels. The bottom 4-inch slab was formed with ⅝-inch plywood forms supported on braced 4×4-inch shores. It was cast monolithically with the 15 beams and the exterior full-depth spandrel beam, which measures 16 inches wide and 4½ feet deep. The pour for the top 4-inch slab was made in formwork supported by the beams. This forming could not be removed. A gunited exterior wall and poured concrete roof enclose this slab to

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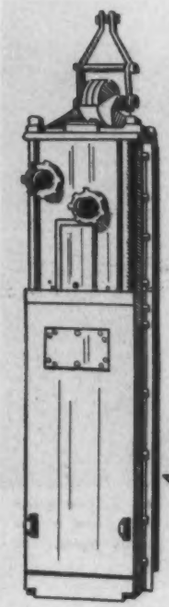

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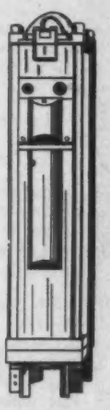

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provide the museum with another gallery area.

The timber shores supporting the formwork for this cantilevered slab had to be kept in place until the 20-inch-thick exterior walls and the three supporting webs were poured to the second ramp level. This was necessary because the slab was cantilevered from the wall and tied by reinforcing bars to three of the building webs. At this slab level, the webs have most of their width outside the exterior walls to provide additional support for the cantilever. The 20-inch wall extends from the second ramp level to the ground-level slab, which is supported by the 40-inch-thick scalloped wall around the lecture hall. Above the second ramp level, the webs get wider on the inside of the 5-inch-thick gunited walls.

Forming ramps

The actual ramp width, or the width completely unsupported by the webs, is constant at 14 feet for the entire height of the building. The width of the ramp, however, constantly increases because of the diminishing inside radius and the increasing outside radius of the spiral. The 10-inch-thick web widths also increase with the height of the building for two reasons. The first is architectural: they allow partitions to be formed between galleries; the second is structural: they provide adequate support for ramps of ever-increasing widths. Reinforcing steel in the webs, however, follows conventional lines throughout the load-carrying member: the steel is decreased as the height of the web increases.

Euclid Contracting is using 4×8-foot sheets of ⅝-inch-thick plywood to fabricate forming for the ramp. Because of the spiraling radii, constant forming adjustments are needed for every inch of the ramp. Full 4×8-foot sheets are laid uncut, with only one edge along the radial projections. Precut pie-shaped plywood sections are then laid adjacent to the full sheets to form the necessary bend around the curve. Then other 4×8-foot sheets are placed adjacent to the pie-shaped boards.

In this way, the full sheets are never cut and can be re-used over and over again. The pie-shaped sections, however, always have to be cut, trimmed, and pieced together to obtain the spiral curvature of the ramp slab. Supporting the plywood forms are closely spaced 4×4-inch timber shores resting on the ramp below. The shores are capped with 4×6-inch stringers which support the 2×6-inch ribs under the plywood forms. The shores are cross-braced with 1×6-inch timber lacing.

"Man of the future" or maybe "Carpenter after forming" should be the name of this plywood sculpture. This first exhibit was made by crews on the job from pieces of scrap plywood discarded by forming crews.

This ramp shoring is kept in place, even after the concrete has reached its ultimate strength, until the next highest ramp slab is completed. This is done because the shores, supported by the ramp below the pour, are designed to support the power buggies used during concrete placement. For pours in hard-to-reach locations, hand buggies are used. This allows the contractor to build a lighter framework. The contractor never builds forms to support power bug-

(*Continued on next page*)

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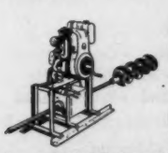

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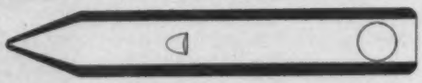

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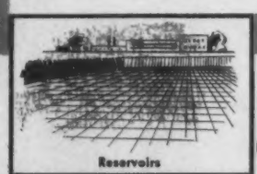
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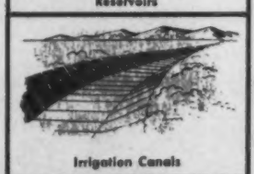
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The concrete underside of a ramp is smoothed by a workman with a Berg concrete-surfacing machine powered by a Griffin 3-kw generator.

(Continued from preceding page)

gies if pours are small and can be handled by the Jackson hand buggies. Whiteman power buggies are generally used to pour the ramps and webs.

Concrete is delivered to the project in ready-mix trucks which dump into a 1-yard concrete bucket on the ground. A P&H 25-ton truck crane lifts the bucket to a hopper at the pour level. Power and hand buggies transport the mix from the hopper to the forms. Pours are consolidated by Mall gasoline-driven vibrators.

In forming sections having small radii, the contractor uses Masonite boards nailed to 1-inch-thick strips of wood. The Masonite boards have varying thicknesses, depending on the curve to be formed—the smaller the radius, the thinner the Masonite. These sections are then attached to a precut wooden template to form the desired curved shape. This technique is being put to good use in forming the two 4-foot-diameter columns alongside the elevator shaft and stairwell area of the museum.

After stripping the forms, the contractor uses a Berg concrete-surfacing machine, powered by a Griffin 3-kw generator, to finish all the concrete surfaces. Euclid is also using Mall and SkillSaw power tools, to handle the great amount of form cutting required on the project. THE END

Fuller Mfg. sales changes

The Fuller Mfg. Co., Transmission Division, Kalamazoo, Mich., has appointed W. E. Niness, former vice president in charge of sales, to a staff position, in view of his retirement this year; and J. A. Packard to general sales manager, responsible for sales and service, with L. C. Butler as his assistant.

In the company's service organization, B. S. Tooker, R. E. Olmstead, and K. B. Klump have been promoted to managerial posts of general service, technical service, and service parts, respectively.

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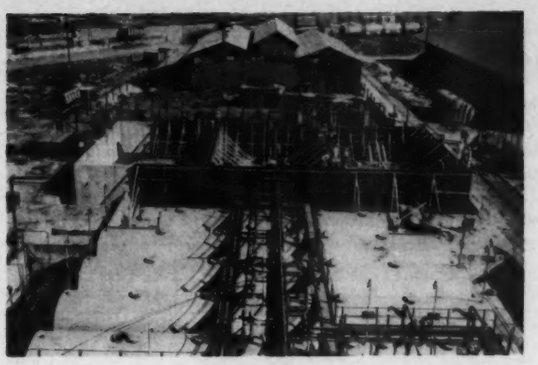

Crews erect Uni-Form panels for walls of a steel mill at Jamshedpur Bihar, India. Kaiser Engineers Overseas Corp. has 900 Indian carpenters and laborers working on this plant expansion job.

Prefab form panels speed concrete work for plant

The job of forming over 200,000 cubic yards of concrete into various structures in temperatures up to 120 degrees, while working with a crew of 900 Indian carpenters and laborers unfamiliar with American methods, is a tough undertaking in itself.

But this was only one of many problems facing Kaiser Engineers Overseas Corp., which has the job of expanding the steel mill of Tata Iron & Steel Co., Ltd., at Jamshedpur Bihar, India. Construction on the concrete portion of the job began in March, 1956, and will be completed next spring.

The contractor ordered 80,000 square feet of Uni-Form prefabricated form panels for the 28-foot-high columns, heavy concrete walls, circular tanks, retaining walls, abutments, and various other structures for the large steel mill. The panel forms measure 24 inches wide and are 3 to 6 feet long.

The forms, which have a plywood face and steel frame, are assembled with standard ties up to 48 inches long. When the thickness of the concrete wall exceeds 48 inches, ½-inch-diameter tie rods are used. This enables the contractor to adapt the forms to a variety of jobs, without the need of special forms.

In order to get as much of the concrete completed as possible before the monsoon season, the contractor keeps the job moving 16 hours per day, six days a week. Aggregate produced locally near the job site is transported by truck to the contractor's batching and mixing plant at the south end of the steel mill project. Cement is purchased locally.

The San Leandro, Calif., office of Universal Form Clamp Co. supplied the panel forms.

Austin-Western appoints

Robert H. Diller has beeen made advertising manager of the Austin-Western Division of Baldwin-Lima-Hamilton Corp., Aurora, Ill. He succeeds Howard F. Barrows, recently retired.

Diller joined Austin-Western in 1951 as assistant advertising and sales promotional director.

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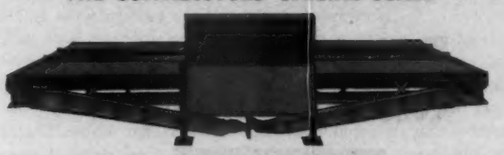

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by **GEORGE E. DEATHERAGE, P. E.**
construction consultant

Every job, irrespective of its size, will require storeroom supplies from pencils to special equipment. All needed supplies should be anticipated at the start of the job. If items are not available when required, there is the added expense of making special trips to get them, plus the loss of production while waiting for them to arrive.

On most work the superintendent, or one of the staff delegated by him, goes over the plans, specifications, and estimates to determine what is required and issue requisitions to cover the items. In many cases this work is performed in one step when a list is made of small tools and equipment to be shipped to the job. The superintendent or project manager directs this operation.

If the superintendent or project manager is continuously on one class of work, he will, from past experience and record, be able to set down in advance the bulk of what is needed, so that the items may all be purchased at one time at quantity prices. The savings made in bulk purchases are tremendous. The wise superintendent will make it a point to keep a record of his purchases on past jobs, using these as a check list and control for new work of a similar nature.

Storeroom, inventory

If the work is large enough, a temporary building will need to be constructed to house the stores. The size of the building depends on the scope of the work under construction, and the amount of material that can be stored outside. Inflammable stores should be in separate fireproof storage, in accordance with local fire ordinances.

It is a good practice to have the storekeeper maintain a perpetual inventory on all construction stores items—items that do not enter into the permanent part of the work. Permanent items, usually covered with a Bill of Material and delegated to the specific job on which they are billed, do not require an inventory record since the checkup engineer carries a report on all permanent items.

The only exceptions to the rule are some classes of work where it is advantageous to carry stocks of sand, gravel, bulk materials, and cement that do not enter into the permanent part of the work. It is more convenient for the foreman to order and

HERE'S THE BIG NEW LINE OF Kelley
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• BUILT FOR ROUGH USE
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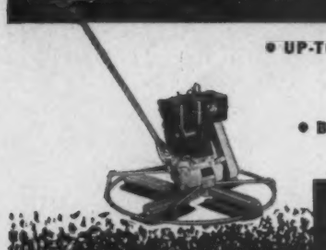

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The new Kelley Compactor with "Compaction Control". An entirely new machine... larger, easier operating, faster and more powerful. For compaction-floating concrete floors, for keying in tough surface hardener materials, and for bonding dry-tamp topping to a base slab.

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Self-propelled... delivering 2400 impacts a minute. Two models: 18" wide shoe, and 36" wide shoe. For packing down earth backfill to maximum density next to foundations, on road-widening jobs, around culverts and in pipeline trenches. Also for finishing black-top driveways.

SPACE HEATERS

What a blast! From the brand new Kelley Hot Shot Space Heaters, one delivering 125,000 Btu/Hr and the other delivering 325,000 Btu/Hr. Let 'er blow outside... work goes on inside with Kelley Hot Shots! For work on walls, floors, scaffolds and hundreds of other construction jobs.

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Model Illustrated
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for further information write: **CUTLER ENGINEERING CO.**
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Geo. E. Duttenger & Son

INVENTORY CARD

DESCRIPTION			STORES SYMBOL	
			ORDER POINT	AMT. TO ORDER
			LOCATION	UNIT OF ISSUE
REQUEST NO.	ORDER NO.	DATE OF ORDER	QUANTITY	

DATE RECEIVED	QUANTITY	DATE ISSUED & CHARGE	QUANTITY & BALANCE	DATE ISSUED & CHARGE	QUANTITY & BALANCE

Figure 1

secure these items from stores as needed, than to expect them to be delivered in the quantities required by the vendor. This is particularly true if the materials are ordered in carload lots to be used and charged to various divisions of the work.

A simple inventory card, figure 1, is all that is needed to maintain the record. The card is posted as the materials are received and requisitioned and when the minimum stock appears. If this system is followed, the storekeeper, receiving copies of all Bills of Material and knowing the quantities needed will not overstock.

The project manager delegates authority to sign stores requisitions to certified individuals. This list is then a matter of record in the storeroom, and materials are issued only to those signatures.

Materials left over from any part of the work, salvaged from demolition, or accumulated from changes being made in the work, should be turned over to the storekeeper. An inventory record can be maintained of these materials and they may then be allocated to other parts of the work or, if not required, sold or disposed of. As the storekeeper should receive copies of the Bills of Material before the materials are purchased, he is able to mark these items up as in stock, if they are required.

Materials part of work

The handling, storing, and delivery of materials called for on the drawings and listed on the Bills of Material may also fall under the jurisdiction of the chief storekeeper. In these cases, structural steel, brick, and other bulk items are routed direct to the job and stored there until needed. The same applies to equipment, but such smaller items as pipe fittings, electrical fittings, and special valves—that must be stored under cover and protected until needed—can be kept in the materials storeroom under the jurisdiction of the storekeeper.

When the storekeeper receives the original Bills of Material, he checks the salvage and other stocks, marking "buy" after the items that he cannot supply. A Stores Requisition is prepared for the materials the storekeeper can supply, and the materials are tagged with the job and the Bills of Material numbers to indicate that they have been allocated to the work and will not be used elsewhere.

If the materials are small items, they are placed in storeroom storage bins and the bins are tagged with the job and Bills of Material numbers. A Master Bin List is maintained at all times, showing what materials are in the various bins.

The original copies of the Bills of Material are routed back to the planning department for requisitioning of the material that needs to be purchased. The storekeeper eventually receives copies of the completed Bills of Material which have been issued to the field after the materials have been purchased; the purchase order number will appear after the item bought. The storekeeper also receives a copy of each purchase order and this, together with the Bills of Material, gives him complete advance information as to what materials have been purchased and for what part of the work.

As the materials are received by the storekeeper, the receipt is indicated on the Bills of Material and the small items put in their respective bins. It may require half a dozen purchase orders to cover the various items on a Bill of Material.

The job foreman is generally interested in having his materials delivered to the job so that work is not interrupted because vital items are lacking. In these cases the most economical and speedy practice is for the storekeeper to hold the items until all that are listed on the Bills

The SP-107 is fully convertible to shovel, crane, dragline, clamshell, or hoe.

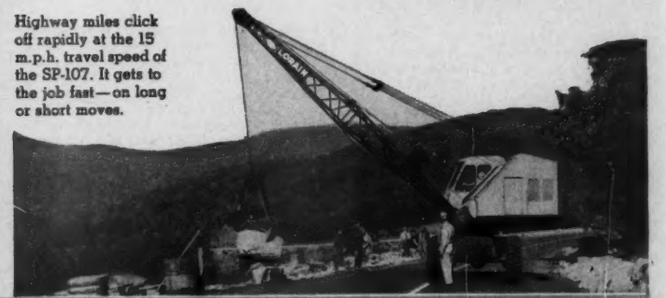
the fast little rig with big ideas...

LORAIN SP-107

This economical, fast, maneuverable, "go-anywhere" Lorain SP-107 can tackle any kind of a construction job. It can speed down the highway, walk into the job with 4-wheel drive, backed up with lugging power, high tractive effort, and big, tubeless tires—and go to work anywhere on a maximum capacity basis without setting outriggers.

This new, 3/8-yd., 7-ton excavator-crane is ideal as a "one and only" tool for the small contractor, or as a "handy-andy" on big construction jobs. The simplicity of this low-cost Lorain makes it easy to maintain — its hydraulically operated controls make it easy to use—and its 4-wheel steer, 4-wheel drive maneuverability will present exciting possibilities to you. A demonstration will convince you that the Lorain SP-107 really is the "fast little rig with big ideas" that pays off in profits. Your nearby Thew-Lorain Distributor can arrange to show you one at work.

Highway miles click off rapidly at the 15 m.p.h. travel speed of the SP-107. It gets to the job fast—on long or short moves.



THE THEW SHOVEL CO., LORAIN, OHIO, U.S.A.

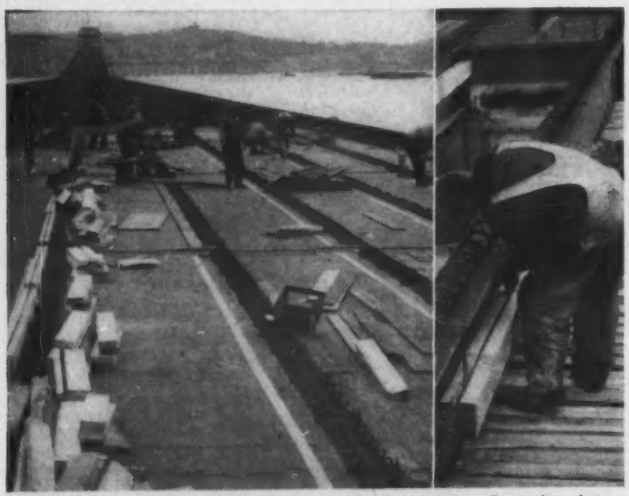
THEW LORAIN.

For more facts, use Request Card at page 18 and circle No. 350

Metal pile shells, supplied by L. B. Foster Co. of Chicago, are driven to support one of a number of structures on this 2½-mile section of the North Illinois Tollway.

A one-crane job of setting 13-ton, 100-foot-long beams for the Mianus River Project at Cos Cob, Conn., is done by a 60-ton Manitowoc Model 3500 with 80-foot boom.

A 7-point hookup is used by a P&H truck-crane to lift a 28-ton tilt-up panel into place for a warehouse in Los Angeles. A Hinds Pick-Up Arm facilitated the job.



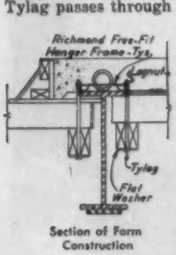
Left: Erecting bridge deck forms. Right: Using Richmond Free-Fit Hanger Frame-Tys, workmen fasten waiers from above. Contractors: Garofano — West-Shore — Euclid. Engineers: Madigan-Hyland.

"Fast forming method & Richmond Hanger Frame-Tys speeded up Tappan Zee deck paving"

Charles Spero

The 6-lane deck of the New York State Thruway Authority's 3-mile long Tappan Zee Bridge took 33,000 yards of concrete and considerable ingenuity. A combination of stock-size plywood sheets, filler strips of wood and metal, and Richmond Free-Fit Hanger Frame-Tys helped get the bridge open early.

Euclid's construction boss, Charles Spero, says they saved lots of time and money by hanging the forms with Richmond Free-Fit Hanger Frame-Tys —45,430 of them. Since the Richmond Tylag passes through an over-size coil and is adjusted by a nut on the upper end, the forms can be handled from above. "These Richmond Hangers speed up the whole operation," Mr. Spero points out. "You don't have to build a lot of scaffolding, work under the deck and risk accidents. The forms are quickly assembled, and easy to take out, too. And there's hardly any repair work to be done.



Section of Form Construction

"What's more, they're more economical when you figure the cost per foot," says this veteran Euclid superintendent. "A lot of fellows who use wires forget to figure the hidden costs —they don't stop to think about the labor putting in the wires and, later, the patching. With wages going up all the time, those savings keep getting bigger."

Richmond Free-Fit Hanger Frame-Ty

Richmond also makes a standard type Hanger Frame-Ty with two helix coils. For use where a slab is haunched to meet the top flange of the steel beam, Richmond makes Offset Hanger Frame-Tys with coils high enough above the top of the beam to permit the metal to be properly set back from the concrete. Richmond Fascia Hanger Frame-Tys combine hanger and fascia-tys for use on outside girders of bridge decks.

All these—along with the complete line of Richmond engineered tying devices, anchorages and accessories—are described in the new Richmond Handbook. To get your copy—or help on a specific concreting problem — write to RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 So. Fourth Street, St. Joseph, Mo.

For more facts, use Request Card at page 18 and circle No. 351

(Continued from preceding page)

of Material have arrived. The storekeeper can then issue what is known as Bill of Material Complete Report, which is issued daily and lists the Bills of Material numbers received.

The job foreman has only to requisition the material by quoting the Bill of Material number. This system eliminates the need for the foreman to continually check the storeroom to see if his materials have arrived or to spend money by sending mechanics to check the stores while their helpers remain idle.

Storing smaller items

For the convenience of all concerned, the engineering department may issue a Line List for piping and electrical work, which is an index of the various lines and circuits numbered on the drawings. Opposite each line number is the Bill of Material number.

The storekeeper should be forbidden to take materials from one part of the work, or one line or circuit, and substitute it for materials that have not arrived on other sections. Materials can be substituted only in an emergency; it creates chaos if made a common practice.

If the job has its own steel and piping fabrication shops, the incoming materials are routed through the storekeeper to the shops with a Construction Shop Order. Anything fabricated is returned to stores for distribution to the field. The storekeeper may pick up the fabricated materials at the shops and deliver them directly to the field to avoid extra handling and temporary storage.

The interim status of all materials deliveries, including complete and incomplete Bills of Material, is summarized weekly by the checkup engineer in the planning department. At the weekly or bi-weekly conference between the project manager and his staff, the planning department can state the current position of any and

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SPEED- jobs get done faster, better.

ECONOMY- efficient, balanced design, sturdy construction assures enduring economical performance.

EASY OPERATION- simple in design, it is easy to operate—pulls sheet steel, wood, concrete, H-beam and pipe piles with the greatest of ease.

Manufacturers of Pile Driving Hammers and Piling Extractors Since 1852

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Even lacking an audience of sidewalk superintendents, a Bucyrus-Erie 51-B shovel with 2½-yard dipper continues excavation for a new 3-block housing project being started in New York City. Lamura Contracting Co. of the Bronx is handling this phase of the work.

Follow-up work in compacting screenings for the base course on a road near York Springs, Pa., is done by a Buffalo-Springfield 3-wheel roller. The rig is being used by Hempt Bros., Camp Hill, Pa., to broom the surface of the base during relocation of a stretch of the road.

all materials and plan the work for the following week.

The materials section of the planning department can advise what materials are ordered or not, those in transit, those received, and the progress of the work to date.

(Next month's article will deal with "Planning and Production: Tools and shop equipment".)

General Tire & Rubber appoints three managers

The General Tire & Rubber Co., Akron, Ohio, has promoted Karl A. Dalsky manager of commercial products and development. He will be responsible for finding out the firm's needs for new lines and types of commercial tires, and will direct liaison between the technical and development divisions and the tire sales division and distributor organizations.

Martin J. Sweeney has been made manager of the company's Pittsburgh, Pa., sales division.

William C. Weirath has been promoted to manager of commercial tire sales. He succeeds Karl A. Dalsky who has been made manager of commerical products and development.

WANTED—DISCARDED
GM51-71-110 Injector Parts
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SALES REPRESENTATIVE—Leading manufacturer of asphalt plants has opening on East Coast for hard-hitting sales representative. Prefer salesman with prior asphalt plant experience. Dealer organization long established. Salary, traveling expenses and bonus arrangement. Good opportunity with one of the oldest manufacturers. Reply Box 508, CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, New York.

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Rooter on wheels or Sheepfoot—Cable operated—Suitable for use with TD-14A tractor. Power Transmission Equipment Co., 1245 W. Fulton St., Chicago 7, Ill. Phone: MOnroe 6-1500

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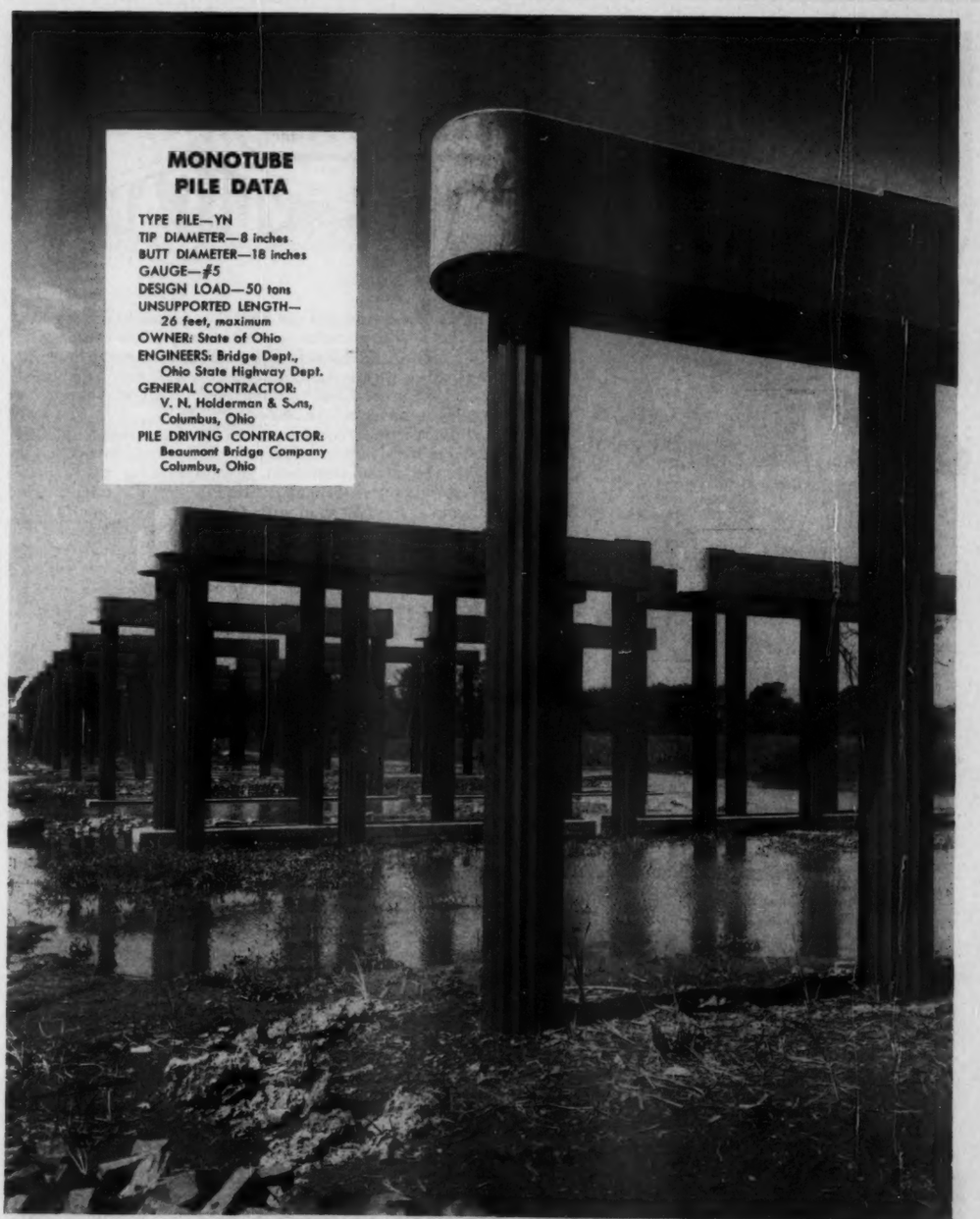
HAYNES PRODUCTS CO., OMAHA 3, NEBR
With FORMULA No. 640



VERSATILITY plus ECONOMY with Monotube piles. When soil conditions at this site in Mansfield, Ohio, prohibited conventional construction in crossing low-lying land, this adaptation of a foundation supported on Monotube steel piles proved to be an economical solution.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL
Monotube Foundation Piles

For more facts, use Request Card at page 18 and circle No. 353

Big is the word for the tunnel that will carry water from a reservoir to a powerhouse for Aluminium, Ltd., at Chute-des-Passes, Quebec, Canada. It will be four times the length of the Holland Tunnel. In this section, 400 feet underground, a Caterpillar tractor-dozer and Athey PR-19 rock wagon are operating.

A fast job of putting a recapped tire on a Euclid end-dump is done by the General Tire Service, Springfield, Mo., for a contractor laying a trunk sewer for the city. The tire-changing truck has a self-leveling hydraulic lift to handle the big tires.

When Vulcan first introduced the Superkut Chisel to the market, it knew that this new tool could outperform any other comparable tool. However, not until it had been in the field for a short time did Vulcan fully realize the tremendous job this tool was capable of doing. Reports from users had nothing but the highest praise for the amazing performance of the Superkut.

Since that time "carbon copies" of the Vulcan Superkut Chisel have attempted to share the attention given this outstanding concrete breaking tool. To avoid confusion, always ask for the *Vulcan Superkut Chisel* when you want to break concrete into large pieces faster, easier, and at less cost than with any other tool. Equally suitable for breaking rock, asphalt, brick or cobblestone pavement.

When you specify Vulcan Superkut, you buy the original — not a "carbon copy."

Specify **VULCAN** *for:*

PAVEMENT BREAKING TOOLS
CLAY DIGGING TOOLS
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PNEUMATIC HAMMER TOOLS
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P.O. BOX 2159 • SAN ANTONIO 6, TEXAS

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Safety keynotes the design of Conn. pike toll booths

Safety is emphasized all along the new 129-mile Connecticut Turnpike. Even toll plazas are built with the idea of protecting motorists and toll takers. The new turnpike has 62 toll booths that are fabricated of quarter-inch steel panels, assembled on boxlike columns of steel bolted together and sealed with a lead seal at all joints. The booths and canopies were specially developed by Taller & Cooper, Inc., Division of American Electronics, Inc., Brooklyn, N. Y.

For the additional safety and comfort of toll collectors, all glass in the new booths is shatterproof and tinted to minimize glare. The glass is heat-resistant to keep the booths comfortable in summer and winter.

All the glass in the booths is set in extruded rubber mold, sealed in place, and made watertight. In case of a collision, the entire panel in the toll booth will yield before the glass breaks.

B-L-H expands facilities

The Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, Ohio, has opened a new office and factory parts warehouse at 2356 Irving Blvd., Dallas, Texas. The structure has 7500 square feet of storage area for Lima shovels, cranes, draglines, and Roadpackers; and a 40×150-foot paved yard for displaying new machines.

Handbook guide details uses of metal grating

The Metal Grating Institute, Inc., Pittsburgh, Pa., has published a "Metal Grating Handbook" containing schematic drawings, tables, and installation photographs, as well as standards and specifications. Intended as a technical reference guide, the handbook represents a complete product standardization in the metal-grating industry.

"Metal Grating Handbook" may be obtained for $1 from the Metal Grating Institute, Inc., 1 Gateway Center, Pittsburgh 22, Pa.

The big job of this Michigan 375A tractor shovel at the Stony Creek quarry of Irving Bros. Gravel Co., Noblesville, Ind., is keeping a haul fleet of 18-cubic-yard trucks on the move. The rig loads a truck in three passes in 1½ minutes; in an average 8-hour day, it handles some 2,500 tons of gravel.

Salvaged rock base and asphalt surfacing from the old roadway serve as base for a traffic-connecting strip on a cloverleaf intersection job near Lubbock, Texas. This International 55 Payscraper is one of a pair spreading the material. West Texas Construction Co., Lubbock, holds the contract.

Indiana to design highways by electronic equipment

The Indiana State Highway Department has started a new program to design superhighways with aerial engineering and electronic equipment. In less than a year, the program will enable Indiana highway engineers to design 4-lane divided freeways in less time and at lower costs.

The highway commission has hired Photronix, Inc., Columbus, Ohio, to help launch the new program of aerial engineering. The new method will be put to use on an 11-mile section of State Route 136 eastward from the Illinois state line.

Duff-Norton appoints

Robert J. Beck has been appointed assistant chief engineer of the jack division of Duff-Norton Co., Pittsburgh, Pa. He will be responsible for research and development work, and all other phases of activity in the engineering department.

CONCRETE TESTERS

The world's finest low-cost precision testers.

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CUBES
BLOCKS
BEAMS
PIPE

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TESTER DIVISION
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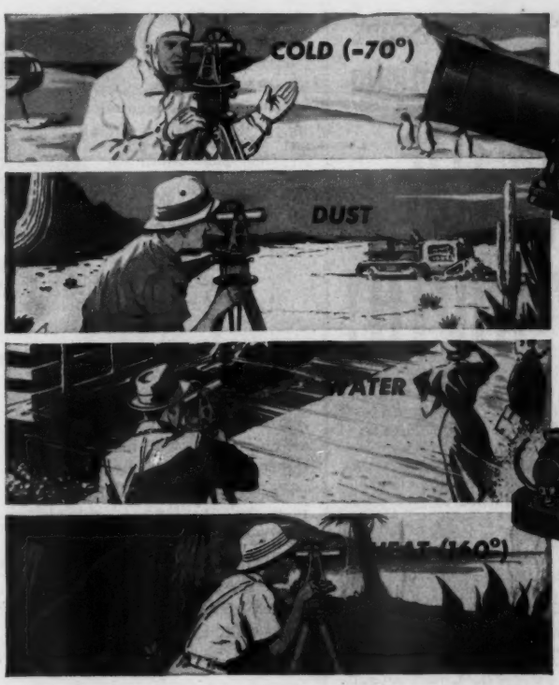

Engineers Transit Model 50

No Weather Worries with Brunson Ball Bearing Construction!

You never have to worry about operating conditions when you use a Brunson instrument. Revolutionary ball bearing construction virtually eliminates the problems of dust, moisture, and extreme temperatures. Your Brunson instrument stays accurate where others fail!

Located in the spindle and telescope axis, Brunson ball bearings are permanently lubricated by an all-temperature lubricant and sealed against moisture and dust. Preloaded and accurate to 5-millionths of an inch, these ball bearings provide highest possible instrument accuracy. Because the bearings are always fully protected and free rolling, wear is practically eliminated. Settings are more precise, frequent cleaning and lubricating are unnecessary. Routine repair and maintenance are reduced to a level never before thought possible.

You pay no more for Brunson's ball bearing construction. You assure accurate, trouble-free instrument performance anywhere . . . anytime! Mail coupon for free literature offer.

"mark one" brass highway surveying monument

Here is a permanent, easily installed surveying monument with a top that can be adjusted to new and different levels at any time. Designed for new or old pavements. Will not freeze, corrode, or break. Will not weaken pavement.

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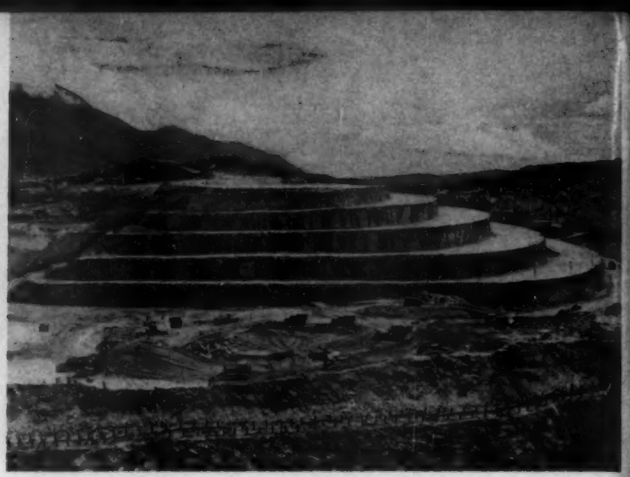
Company_____

Address_____

City_____ County_____ State_____

For more facts, use coupon, or Request Card at page 18 and circle No. 357

Base material for a stretch of Missouri Route 71 near St. Joseph is put down by a Blaw-Knox P-150 base paver. J. A. Tobin Co., Kansas City, Kans., the general contractor for this highway job, is laying the material at rates up to 400 tons per hour.



Carved from a hillside, this contoured foundation will be used for a new $25 million business center in Caracas, Venezuela. The Helicoide, a spiral-shaped building, will be built into the side of the hill. It will rise 25 stories high on one side and 10 stories high on the other.

ROSCO'S PRESSURE METERING MAKES THE DIFFERENCE AT ANY WIDTH!

Do you know . . .

that it's possible to apply bitumen through any length of spraybar from 1 to 24 feet *without changing the pressure and without any application adjustment?* It can be done with a Rosco! You would normally expect surges or drops in pressure to occur when sections of a distributor's spraybar are shut-off or turned on.

But . . .

NOT with a Rosco Distributor equipped with exclusive Pressure Metering. Even when as much as 23 feet of a 24-foot spraybar are shut-off, the precise, accurate delivery remains unaffected . . . the pressure in the working one foot stays the same as it was pre-set at the beginning of the run. The accurate delivery from the working nozzles is not affected . . . no matter how many feet of the bar are cut out.

No adjustments in truck or pump speed are required—in fact, with Pressure Metering the pump speed never changes and normal wear of the pump never affects the accuracy of the application. When any part of the spraybar is shut off, the excess material is automatically by-passed. Pressure at the operating nozzles stays the same. When additional nozzles are turned on, pressure is immediately available to supply them.

One control sets the pressure specified for the job. After that, pressure control is automatic . . . the operator can concentrate full attention to spotting the material properly on the road. Pressure Metering is an integral part of Rosco's patented Master Valve that permits one-lever control of all normal distributor functions. You'll find that Rosco's Pressure Metering is faster and more accurate —factors which can be the difference between a "make" or "break" job in today's highly competitive field. And Rosco's Pressure Metering assures you of jobs that will always meet rigid application specifications.

Let your Rosco dealer show you how Pressure Metering will pay off for you. Or write the factory for descriptive literature with specifications on Pressure Metering-equipped Distributors.

ROSCO BITUMINOUS DISTRIBUTOR with Pressure Metering. Front or rear mounted for truck or trailer.

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DISTRIBUTORS • MAINTAINERS • BROOMS
SUPPLY TANKS • TAR KETTLES • STREET FLUSHERS

For more facts, use Request Card at page 18 and circle No. 358

The base members for a 2,400-square-foot home rest on cylindrical foundation piers which extend down 9 feet to bedrock.

Welded steel house frame floats on concrete piers

Rigidity, permanence, and elimination of wall cracking due to settling are characteristic of rigid steel frames for structures. But any frame is at the mercy of its foundation, so Paul F. Watson of the Watson Foundation Co., Inc., Fort Worth, Texas, conceived an innovation in home foundations. He set base members of the welded frame for a 2,400-square-foot home on 42 cylindrical concrete caissons.

The piers, which extend down 9 feet to bedrock, are sheathed in Sonotubes, a non-metallic lining material which prevents bonding to adjacent earth. The outer members of the frame base are fabricated from longitudinal angles and diagonal bracing angles are welded together. These, along with the central I-beam joists, are held to the piers by lag bolts set into the concrete on the top surface.

The principle, new to residence con-

SYNTRON

with automatic bit rotation

ELECTRIC HAMMER DRILLS

take all the work out of drilling holes in concrete and masonry

You can drill more holes easier and faster in concrete and masonry with SYNTRON Electric Hammer Drills because—There's no more tiresome quarter-turning of drill chuck by hand—just hold the Hammer Drill in place, the easy-to-operate, SYNTRON Hammer Drills deliver 3600 heavy blows per minute and automatically rotate drill bit for easy drilling. The unique electromagnetic drive does away with unnecessary moving parts, lowering maintenance costs.

SYNTRON Hammer Drills are available with capacities from ⅜" to 2" diameter holes. Operate from 115 volt 60 cycle a-c. **C258**

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for additional information write to: Dept. C&E

SYNTRON COMPANY

227 Lexington Ave. Homer City, Pa.

For more facts, use Request Card at page 18 and circle No. 359

A start is made on the E-Z Pulp Division plant at Demopolis, Ala., for Gulf States Paper Corp. H. K. Ferguson Co., Cleveland, Ohio, is using a Lorain 820KS with 60-foot boom and Hendrix 2½-yard dragline bucket for service-road grading and other work in the 200,000-yard excavation item.

Concrete for a five-square-mile residential construction project is supplied by this Noble-Mobile batching plant near Wichita, Kans. Allen's, Inc., Speedimix Concrete, which operates a permanent plant four miles from the site, erected this plant to cut down on long and costly hauls.

struction, is a modification of the system employed for many skyscraper foundations. Masonry walls of the house, and the fireplace, are supported on a steel apron welded to the lower base angle of the frame, thereby keeping the entire structure above ground level.

Community vs. new highway subject of film

"Highway Hearing," a 16-mm motion picture in sound and color, is announced by The Dow Chemical Co.

Aimed at creating better public understanding of the Federal Interstate Highway Program, the half-hour film depicts the effects of a proposed new highway on the citizens of a typical community. A public hearing—in accordance with the provision in the Federal Highway Act of 1956 that public hearings be held whenever a segment of the Interstate System bypasses or passes through a city, town, or village—is dramatized, with the philosophy of "the most good for the most people".

The film is available for local showings before civic, church, professional, and other adult groups, as well as in schools and colleges. Distribution is handled by the Modern Talking Picture Service, 3 E. 54th St., New York, N. Y.

Hercules Motors expands Houston branch

Hercules Motors Corp., Canton, Ohio, has moved its Houston factory branch to larger, modern quarters at 5031 Gulf Freeway, 3½ miles from downtown Houston. The new facilities provide one-third more space, making it possible for the firm to keep gas and diesel engines and power units, plus expanded facilities for engine rebuilding and repairs.

James A. Embry is regional manager of the Houston branch, and David A. Otto, branch manager.

LOW COST POWER
for WRECKING-SMASHING
FREDERICK CAST Semi-Steel
DROP BALLS

Tough, rugged Frederick Drop Balls eliminate expensive drilling, blasting . . . deliver smashing low cost power when you want it, where you want it. Exclusive "Pear-shape" design drops straight—swings true—withstands greater impact. Balls 4000 lbs. or over are made of extra durable nickel alloy—or special alloys furnished on request. "E-Z" Swing recessed steel eye gives greater cable protection plus free swinging action. Balls can be furnished with replaceable pins. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Special release hooks for free dropping also available.

Wide range of sizes and weights:

Pear shape (lbs.).....	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.).....	500	1000	2000	5200			
Spherical shape (lbs.). (for magnet use)	470	950	1650	2400	3000	3700	5400

Write us today for prices and illustrated literature; order Balls direct or see your nearest Equipment Dealer.

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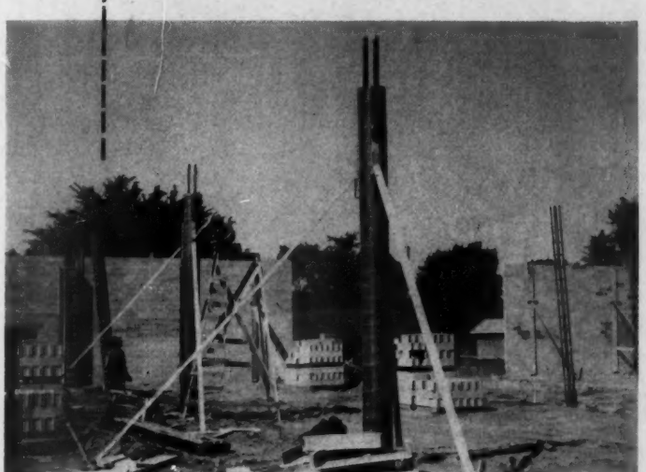
Money-saving forms for *round* concrete columns!



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Bernard Greenbaum, owner, designer and builder.

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SONOCO SONOTUBE Fibre Forms save time, money and labor. These easy-to-handle, lightweight fibre forms erect quickly and require minimum bracing.

Sonoco SONOTUBE Fibre Forms provide the fastest, most economical method of forming round columns of concrete.

Approved by architects and engineers and used by contractors everywhere, these low-cost fibre forms are being specified to form underpinning, piers, piles and supporting columns.

Order Sonoco SONOTUBE Fibre Forms for your next job . . . in sizes from 2" to 48" I.D. Standard 18' lengths, special lengths to 48' available. Can be sawed to requirements on the job. For finished columns, use Sonoco's patented "A"-coated SONOTUBE . . . wax-coated also available.

See our catalog in Sweets

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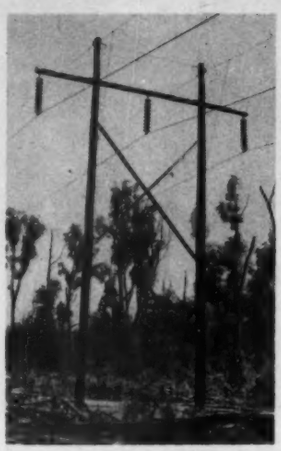
- BRANTFORD, ONT.
- MEXICO, D.F.

SONOCO
Construction Products
SONOCO PRODUCTS COMPANY

For more facts, use Request Card at page 18 and circle No. 361

A jacket of steel mesh covers the upper part of power transmission poles in Louisiana's Atchafalaya swamp to discourage king-size woodpeckers.►



The lighter side

Before the 11-inch-diameter poles were covered, some were holed out to as much as 7½ inches in diameter. This entrance is 4½×4½ inches.

A new use for steel mesh has been found by field crews of the Stone & Webster Engineering Corp., which are building electric power lines in the Atchafalaya swamp region of Louisiana. Seems that the woodpeckers in that area grow to the size of chickens and like nothing better than to chip out nests for themselves in the wooden utility poles that carry transmission lines. Whether the poles are chemically treated or not makes no differences to the voracious woodpeckers. In an 11-inch-diameter pole, for instance, the birds would hollow out a 7½-inch-diameter hole leaving walls only 1¾ inches thick, with an average 4½×4½-inch opening to the nest. As a result, the tops of many poles were breaking off, leaving a section with the cross arm dangling.

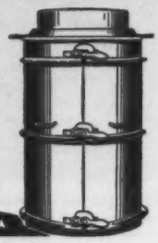
Engineers from the Boston firm outsmarted the woodpeckers by covering the upper half of each pole with a jacket of steel mesh. So far no bird has been able to peck through the ¼-inch steel of the 19-gage galvanized hardware cloth. The Stone & Webster men discovered, too, that they did not have to put the mesh jacket below a 20-foot height on the poles. For some strange reason, Louisiana wood-

No Matter What SIZE... No Matter What SHAPE...

QUINN CONCRETE PIPE FORMS

Set The STANDARD For Producing Quality Pipe!

Over 50 years of experience go into the production of every Quinn Concrete Pipe Form. That's why the Quinn Heavy Duty form is recognized as the STANDARD the world over for producing quality concrete pipe at the lowest cost. Used in making pipe by vibration, spading, or tamping. Sizes for pipe 10" to 120" and larger. Tongue and groove (as shown) or bell end pipe in any length desired. No matter what size, shape, or length pipe you need, there's a Quinn pipe form made to fit your requirements. Write today for our FREE catalog and estimates.



Also Manufacturers of QUINN CONCRETE PIPE MACHINES

Quinn WIRE & IRON WORKS BOONE, IOWA

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Track Overhaul Time Cut 50%

OTC "Trackmaster" Track Press

By pressing pin and bushing simultaneously, without broaching or shearing sidelinks, all size tracks can be overhauled faster, safer and easier with the new OTC "Trackmaster" hydraulic track press. With grousers off or on (2 bolts removed), the "Trackmaster" one-man operation does a better job, with complete safety to the operator. Basic specs—ram capacity 125 tons; hydraulic winch—5800 lb. pull; power—either gasoline engine (11.4 hp) or electric motor (7½ hp).

NEW OTC HYDRAULIC-POWERED TRACK-BOLT IMPACT WRENCH

OTC's amazing new impact wrench (1" square drive) eliminates the need for an air compressor or an electric power source by receiving trouble-free hydraulic power from the "Trackmaster" basic hydraulic system.

TRAILER-MOUNTED "TRACKMASTER"

Now—take the "Trackmaster" to the jobsite for faster track work and less downtime. THD Wisconsin gasoline engine (11.4 hp @ 2200 rpm) is standard, although any motor of sufficient horsepower can be used. Trailer width overall: 7'2".

WRITE NOW FOR FREE DETAILED INFORMATION

OWATONNA TOOL COMPANY

381 Cedar Street • Owatonna, Minnesota

For more facts, use coupon, or Request Card at page 18 and circle No. 363

announcing a whole new line of single axle over-the-wheel platform trailers

NEW MILLER model "J" Tilt-Tops

available in 3 capacities

"J-6" six tons
"J-8" eight tons
"J-10" ten tons

model illustrated
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The new "J" line... more husky than the "B" line of over-the-wheel platform models it replaces... is introduced at *no increase in price*... again offers economy minded contractors *more capacity per dollar.*

And you get all the speed and handling ease that helps you cover more jobs *with one rig!* One man can tilt, simply drive the equipment onto the broad oak decked platform, be on his way in less than two minutes. Shuttling tractors or other rigs from one job to another is so easy, so fast... it can often save duplicating expensive equipment.

Each new "J" model has the new extra deep side channels for maximum strength right at the platform edges where wide tracked rigs impose heavy strains.

See these new production boosters at your MILLER distributors today.

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Complete with platform and tires.
Any optional equipment extra.
Plus 10% Federal Tax

new 10" deep side channels

Extra deep side channels integrally welded to heavy cross members, provide rigid support for the heavy strains imposed along the edges by wide tracked rigs.

"H" beam axle

Super tough, this H beam straight-thru axle has solid steel, stub inserts for extra strength over rough roads. Long life Timken roller bearings assure positive wheel alignment.

Miller® Tilt-Top Trailer Inc.

✓built best ✓priced best

See your MILLER distributor or write for FREE literature

456-B South 92nd St. • Milwaukee 14, Wisconsin

For more facts, use Request Card at page 18 and circle No. 364

The pileated woodpecker, the size of a chicken, has now gone back to building homes in trees.

peckers do not hammer or chip at anything below that height.

• • •

Ospreys frequent Shelter Island off the eastern tip of Long Island, N. Y., and these large birds have a particular yen for building their big nests around the crossarms of utility poles. Consequently, power and light interruptions occurred frequently when an osprey electrocuted itself and shorted a circuit. In this case utility engineers solved the problem by building wooden platforms on top of the poles away from the crossarms and wires. The ospreys were delighted with the solid foundations provided for their nests, and avoided the precarious crossarm locations. Result: birds and engineers have been happy ever since.

• • •

What's-in-a-name department: at its annual meeting in Washington last month, the Highway Research Board had for opening-day speakers two gentlemen by the name of Boring and Duhl. They were far from that. As reported elsewhere in this issue, M. M. Boring, a technical talent scout for General Electric Co., gave a spirited talk on the technical manpower problem. Dr. Leonard J. Duhl, a Bethseda, Md., psychiatrist with the National Institute of Mental Health, discussed the effect of highway problems on the mental health of a community. As far as we know, this is the first appearance of a head shrinker on the HRB program.

• • •

In the lobby of Washington's Sheraton-Park Hotel, where the Highway Research Board met last month, was a big blackboard on which messages are chalked for the convention-goers. On Wednesday night of the meeting week, delegates raised their eyebrows at this message scrawled across the top of the big board, "Chas. Barnes—we went to the burlesque, don't wait for us." That left us wondering if Charlie caught up with his anonymous friends, or if he, like a zealous student of the Bureau of Highway Traffic at Yale, attended the evening session of the Highway Research Board.

Standards revised for power machines

A recommended standard to aid users of power cranes and shovels has been presented to the industry by the Commodity Standards Division, Office of Technical Services, U. S Dept. of Commerce. It combines the present domestic standard, CS90-49 with the export standard, CS90E-47 The main objective of these standards is to establish uniform methods for specifying the machines.

Copies of the Recommended Revision are available on request from A. S. Best, Commodity Standards Division, U. S. Dept. of Commerce, Washington 25, D. C.

The nationwide drive for highway safety and increased winter driving in the ice and snow belt have brought the volume of salt to be used in snow and ice control to a record two million tons for the 1957–1958 season, according to an estimate from the Salt Institute.

SWENSON SPREADERS
FOR ICE CONTROL

SPREADS SALT 200 LBS. PER MILE
OR IN ANY DESIRED AMOUNT
Lays a Narrow Strip or Full Traffic Lane

Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

Write for complete information

SWENSON SPREADER & MFG. CO.
LINDENWOOD, ILLINOIS

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Photo courtesy of Pettibone Mulliken Corp., Chicago, Ill.

MARVEL Synclinal FILTERS
are Standard Equipment
Pettibone "SPEED SWING"
180 Degree Swing Loaders

SUMP TYPE
(Cutaway)

MR. A. T. LOGUS, Chief Engineer of Pettibone Mulliken Corp. expresses preference for Marvel Synclinal Filters as follows—

(A) "The ratio of the total filtering net area to the net area of the inlet pipe is much higher than any other oil filter on the market.

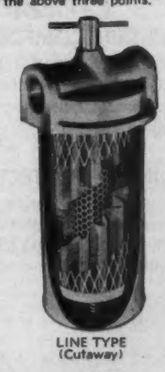
(B) The direct result of the high area ratio is lower hydraulic pressure drop over prolonged operating periods.

(C) All materials used in manufacturing the Marvel Filters are impervious to corrosive action from the additives and other elements contained in oil.

I might add that the price of these filters is lower than some makes of oil filters that are much less desirable on the basis of the above three points."

OVER 800
Original Equipment
Manufacturers

of stationary or mobile equipment utilizing hydraulic or other low pressure liquid circulating systems are installing Marvel Synclinal Filters as Standard Equipment.



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Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be attained by multiple installation (as described in catalog). Choice of monel mesh sizes range from coarse 30 to fine 200.

EASY TO CLEAN

Both sump and line types are easily disassembled, thoroughly cleaned and reassembled on the spot, in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

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Catalogs contain dimensional charts and complete engineering data making it easy to order a filter for your specific requirements and get Immediate Delivery.

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☐ Catalog #200—For Fire-resistant Hydraulic Fluids (Aqueous Base)
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3 TO 25 TONS
CAPACITY

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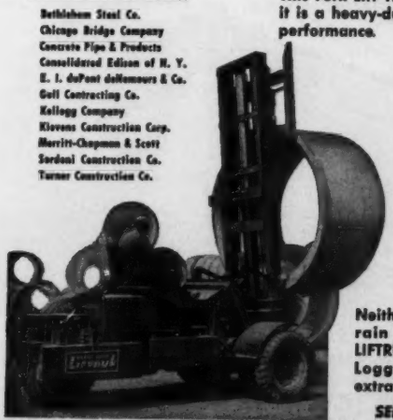
This Fork Lift Truck is no "prima donna," but it is a heavy-duty beauty with smooth-as-silk performance.



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- Generous Underside Clearance, chassis to ground.
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***Full-Shift* PROTECTION . . .**

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Makers of Dotmar Magnesium Forms, Brush Cutters and Roadside Seed Bedders.

Dotmar INDUSTRIES Inc.

519 HANSELMAN BLDG. KALAMAZOO, MICH.

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For Top Efficiency, Kiewit Uses Kolman Portable Plants in Minot

(Below) 50'x42" Kolman Model 101 with SB-90 Vibrating Screen loads trucks with screened aggregates while scalping out oversize.

Series of Conveyor-Screen Plants Produces Variety of Aggregates

Using a series of Kolman Portable Conveyor - Screen Plants, Peter Kiewit Sons Co., Omaha, produced the aggregates for paving the Air Force base at Minot, N. D., with maximum efficiency and low cost.

On a typical set-up, two Cat D-8 dozers were kept busy charging the reciprocating feeder-trap of a Kolman 50'x42" Portable Conveyor. The 9'x54" Kolman SB-90 Vibrating Screen scalped out all plus-1½" rocks, passing the screened materials into trucks.

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KOLMAN MANUFACTURING COMPANY

4922 West Twelfth St. Sioux Falls, S. Dak.

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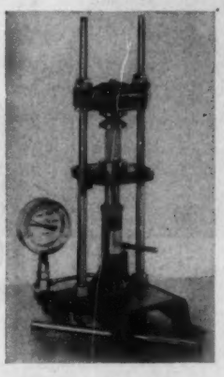

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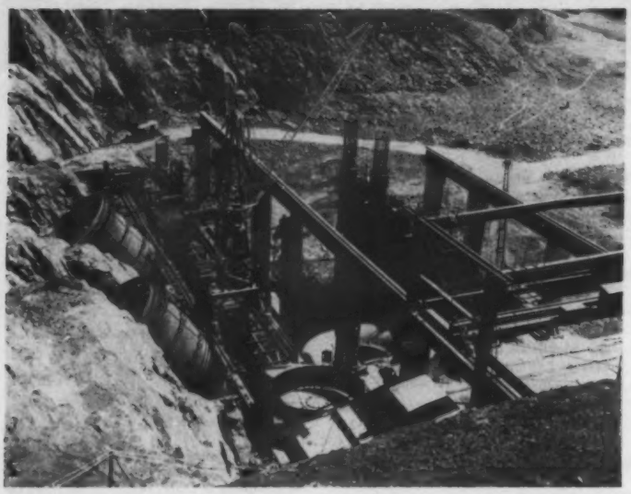

The six huge Francis turbines at the Caroni River dam in Venezuela.

Venezuela builds new dam, powerhouse, steel mill

The first phase of an ambitious industrialization plan will be initiated by the Venezuelan government in April, when a new $36 million dam and hydroelectric plant will be put in operation on the Caroni River, ten miles south of Puerto Ordaz. Ultimate power production, through six Francis power turbines, is estimated at 300,000 kw, although for 1958 the figure is 50,000, and for 1959, 200,000 kilowatts.

Practically the entire volume of electric power from the new dam and powerhouse will be consumed by an equally new steel mill, which is under construction ten miles west of Puerto Ordaz on the Orinoco River. Production of the mill is expected to reach 1,200,000 tons of finished products a year by the end of 1960. Initial production will include seamless steel and cast-iron tubing, structural rolled sections, reinforcing rods, steel coils, and similar material. The cost of construction for the first-stage facilities will amount to $360 million; $60 million will be added for completion of the second stage.

Housing for workers at the mill will be in the neighborhood of 5,000 units for 25,000 inhabitants during the first stage of production. Later these figures will be raised 12,000 units and 60,000 persons.

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For more facts, use Request Card at page 18 and circle No. 373

Chain Belt elects Bosnian

L. H. Bosnian has been elected a director of the Chain Belt Co., Milwaukee, Wis., taking over the position held by J. C. Merwin, who has recently retired from the firm.

Bosnian, who joined the firm in 1919, was elected vice president of facilities in 1952, and a senior vice president in 1957.

New service set-up at Eagle Iron Works

Eagle Iron Works, Des Moines, Iowa, has created a new department, headed by L. A. Steinbach as parts and service manager, to increase service facilities. All parts orders were formerly handled by the production department.

At the same time, M. N. Cunningham has been named production manager. Working together, Steinbach and Cunningham will put into effect methods they have developed to aid replacement-parts service.

White Motor appoints

Frank Potts, former manager of the Montreal branch of the White Motor Co. of Canada Ltd., has been appointed assistant to the vice president and general manager of the company's Autocar Division, in Exton, Pa.

He succeeds Robert G. Oakley, who recently became White's branch manager at Cleveland, Ohio.

Kensington Steel names

Wilbur E. Ellis has been named general sales manager for the Kensington Steel Co., Division of Poor & Co., Chicago, Ill. He will work from headquarters at the main office in Chicago. Succeeding Ellis as Eastern sales manager is Joseph F. Milmine, former Southeastern sales manager.

Publishers postscript

If you read CONTRACTORS AND ENGINEERS from front to back (some people *do* read or scan back to front, you know) you may have noticed two feature picture stories on the Guggenheim Memorial Museum and the Pan American maintenance hangar at

Anthony T. Mavroudis

Idlewild airport. Both of these are the handiwork of our Eastern field editor, Tony Mavroudis, and perhaps you'd like to know a bit more about him.

Tony hasn't wasted many days in his career so far. Immediately after obtaining his C. E. degree from College of the City of New York in January 1953 he found himself a second lieutenant in the Corps of Engineers. Highlight of his tour of duty was criss-crossing the U. S. as an interpreter with a mission of foreign army officers who were studying the engineering techniques of our Corps of Engineers. A later assignment placed him as resident engineer, supervising construction of a radar installation in Newfoundland.

We learned of Tony's interest in construction writing while he was still in the Army, and he joined our staff all of five days after getting out, early in 1955. Since that time he has covered 160 jobs for us all up and down the eastern seaboard including such name projects as the St. Lawrence Seaway, Florida's Sunshine State Parkway, Baltimore Harbor Tunnel, Fort Pitt Tunnel, and all the eastern turnpike operations. He has good reason to know that editorial coverage in the field is one of the toughest ways there is to earn a salary, but that it is so varied and interesting that it beats working for a living.

Tony and his boss, Editor Bill Quirk, share one enthusiasm in common—a great fondness for tennis either as player or spectator. Tony lives even closer than Bill to the West Side Tennis Club in Forest Hills, and it takes plenty of publisher pleading to get either of them away from home base during the national tournament each fall. Music is another sideline Tony likes to indulge in when time permits. His skill on the clarinet has earned him billing at our office Christmas parties as the poor man's Benny Goodman.

One thing Messrs. Mavroudis and Quirk don't see eye to eye on is smoking. Ever since joining our staff Tony has been on the receiving end of his boss' powerful anti-nicotine crusade, but all to no avail so far. Since their two offices practically adjoin, Bill is threatening to exile Tony to the field on a 365-day basis if he doesn't mend his ways.

If he should happen to drop in on you for job facts or photographs one of these days, give him all the cooperation you can, short of a cigarette or even a light!

Don Buttenheim

PUBLISHER

Chrysler Corp. appoints

Arthur S. Hudson, assistant comptroller of Chrysler Corp. since 1952, has been appointed president of the company's Marine and Industrial Engine Division.

At the same time plans were announced for an intensification of marine and industrial engine sales, engineering, and research activities.

Atlas assigns de Jounge

Atlas Copco Pacific, Inc., San Carlos, Calif., has made Lars Allon Gustaf de Jounge the special Sandvik Steel Works technical representative for eleven western states.

With headquarters in San Carlos, Calif., de Jounge will help make Pacific's engineering staff services available to construction firms.

Lincoln Electric appoints

The Lincoln Electric Co., Cleveland, Ohio, has appointed three men to its district offices. Paul McGonigle is at the Boston, Mass., office; Richard R. Gould at the Pittsburgh, Pa., office; and Jerry Weiss at Detroit, Mich.

Cone Bros. Contracting Co. is using the following Caterpillar-built equipment on this job: DW21-No. 470 LOWBOWL Scrapers; D9, D8 and D7 Tractors and a No. 12 Motor Grader. The DW21 units have a capacity of 25 cu. yd. heaped, 18 cu. yd. struck. Their LOWBOWL design pays off in high production at lower cost per yard.

"We have observed other machines and have come to the conclusion that our Caterpillar-built rigs have much less down time. We have found them more dependable. We're 100% Caterpillar on this job." **Charles E. Bailes, Jr., Superintendent of Cone Bros. Contracting Co., Tampa, Florida.**

Five DW21-No. 470 LOWBOWL Scrapers spearhead the Caterpillar line-up used by Cone Bros. on a 23-mile, $1,500,000 road building project in Florida. One section, running 12 miles from U. S. 41 at North Naples to Immokalee, involves moving about 500,000 cu. yd. of sand and marl. In extremely heavy going, the five DW21s hauled 120 loads in 10 hours over the two-mile round-trip. Each DW21 unit carried 21 cu. yd. per load. Here you see one of them being push-loaded by a D9.

CAT LOWBOWL Scrapers for lower cost per yard. As Superintendent Bailes observed, Caterpillar-built rigs "have much less down time" and "are more dependable." These are factors in high production. And in the case of Cat Scrapers, there's another big factor—exclusive LOWBOWL design. On job after job, matched against current models of other makes, Caterpillar LOWBOWL Scrapers have handled material at lower cost per yard. This is a fact, not a claim. It is completely documented by data covering road conditions, materials handled, load times, haul times, cycle times, bank yards per trip as well as the real payoff—cost of dirt moved per yard, the only true measure of a machine's productive capacity!

Your Caterpillar Dealer has proof. All these job facts are on file at your Caterpillar Dealer's. Have you seen them? They'll give you a good idea how Cat LOWBOWL Scrapers can lower your earthmoving costs. Your dealer will be glad to show them to you. He'll be glad to demonstrate, too—just say when and where, he'll be there!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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TRACTOR SHOVEL CUTS EQUIPMENT INVESTMENT

How Arizona Contractor used Michigan Model 175A as loader, dozer, shovel, backhoe and dragline

West of Globe, Arizona, where the Arizona State Hwy Dept has a section of U.S. 70 under reconstruction, Fisher Contracting Co of Phoenix had a lot of tough, costly jobs to do.

First, a long stretch of old concrete pavement had to be ripped loose and removed. Bridge footings had to be dug into solid sandstone. There were channel changes to make and digging to be done under low high-tension wires.

So widely diversified were these jobs that a contractor, thinking in traditional terms, would have assigned drilling equipment to the sunk-in-stone bridge footings . . . dozers and loaders to dirt removal . . . draglines or shovels to other excavation. But the Fisher company needed *only one machine* for all excavating and loading . . . their Michigan Model 175A Tractor Shovel!

Breaks out 10 to 12-inch concrete

Its first assignment was loading out over a mile of the old pavement. In most places, the concrete was 40 ft wide *and 10 to 12 inches thick.* Use of a big tractor with rear-end ripper broke and loosened most of the old slab, but still left some sections needing breakout, and a lot of whopping big chunks requiring loading. Both breakout and loading proved "made to order" for the Michigan.

Loads 25 cu yds in 4 minutes

Later, the problem was complicated by need to load into huge mining-type trucks with dump beds over 10 ft high. Here again the Michigan did a fine job. Its load time for each 25 cubic yard heap averaged only four minutes—and—according to Operator Dick Winans—was done "without working the operator to death".

Digs sandstone, saves blasting

When pavement loading became caught up, the 24 mph Michigan ran over to where a bridge was called for in the plans. Here it first removed overburden. Then, by working bucket back and forth, it gouged out sandstone footings to required 3 ft depth. This digging method saved drilling and blasting at a location close to existing buildings.

Works in stream under low wires

Another big job done by the Michigan was to load 40,000 cubic yards in a channel change, deepening existing streambed above the new bridge. For shovel or dragline, loading would have been extremely tough because low hanging high-tension electric lines criss-crossed the area. Michigan, however, handled the mucky material easily with clearance to spare. Machine did dozer work too . . . cleaning haul roads and dozing streambed alluvium from under bridges. "Great work-ability, plus *day-after-day dependability,* made the Model 175A one of the most important pieces of equipment on our project," said one company official. "It played a major role in bringing the project to completion ahead of schedule!"

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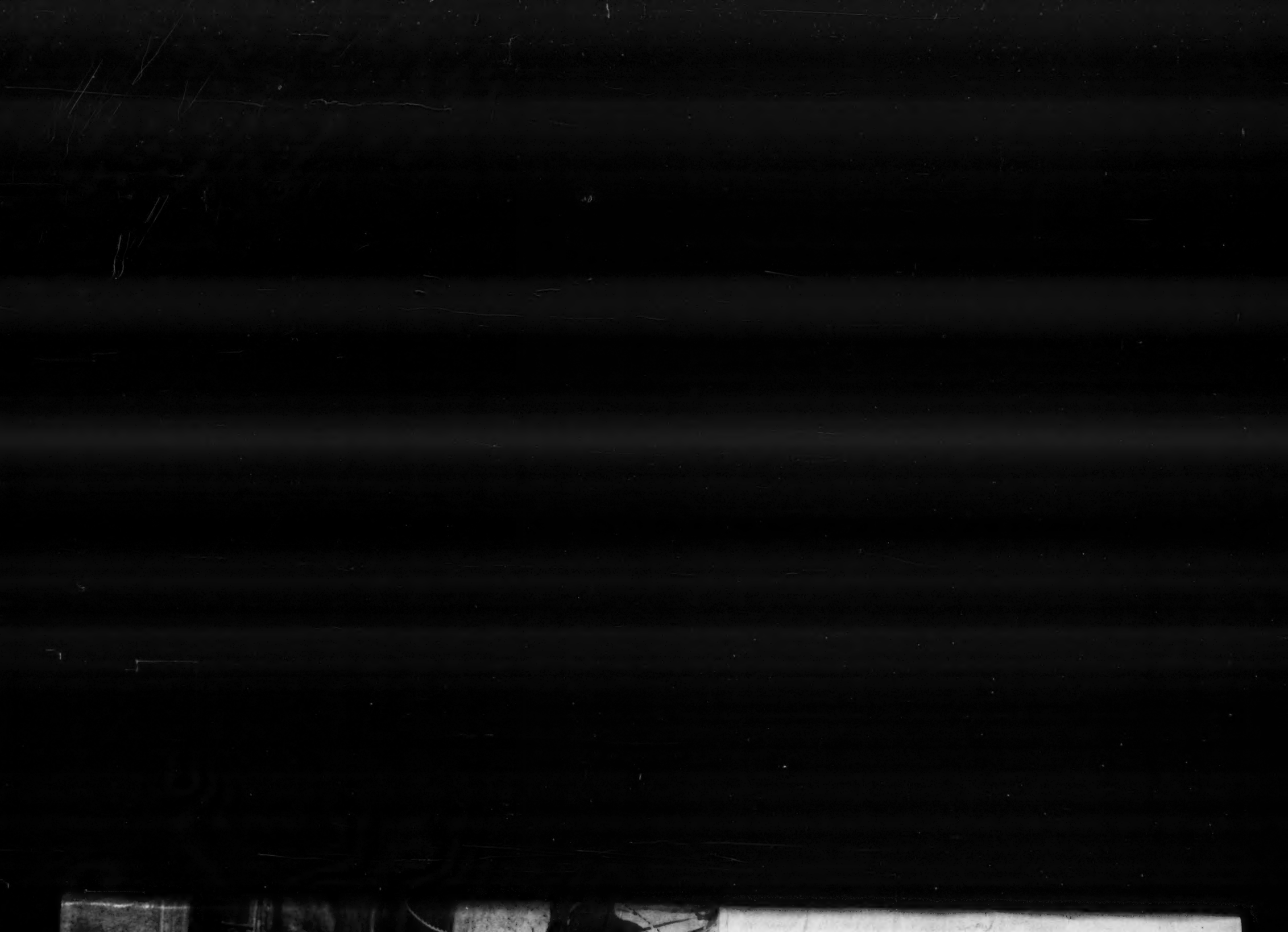
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